GS/VIPER50DS

OPERATING MANUAL

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SAELEN® TS INDUSTRIE®

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RÉPUBLIQUE FRANÇAISE

INPI
INSTITUT NATIONAL DE LA PROPRIETE INDUSTRIELLE

BREVET D'INVENTION

Code de la propriété intellectuelle-Livres VI

DECISION DE DELIVRANCE

Le Directeur général de l'Institut national de la propriété industrielle décide que le brevet d'invention n° [illegible] dont le texte est ci-annexé est délivré à :
SAELEN S.N.S. Société anonyme - FR

La délivrance produit ses effets pour une période de vingt ans à compter de la date de dépôt de la demande, sous réserve du paiement des redevances annuelles.

Mention de la délivrance est faite au Bulletin officiel de la propriété industrielle n° [illegible] (n° de publication [illegible]).

PATENT FOR INVENTION

Intellectual property law-Books VI

GRANTING DECISION

The General Manager of the National Institute of industrial property has decided that invention patent # ##-##### the text of which is appended shall be delivered to:
SAELEN S.N.S. Company - FR

The delivery produces its effects for a period of twenty years starting on the date of deposit of the application, under reserve of payment of the annual royalties.

Mention of the delivery is made in the Official Bulletin of industrial property ###/## of ##:##:## (publication # # ### ###).

D. HANGARD

INSTITUT NATIONAL DE LA PROPRIETE INDUSTRIELLE
SIEGE
26 bis, rue de Saint Petersbourg
75800 PARIS cedex 08
Téléphone : 01 53 04 53 04
Télécopie : 01 42 93 59 30

ETABLISSEMENT PUBLIC NATIONAL CREE PAR LA LOI N° 51-444 DU 19 AVRIL 1951

INTRODUCTION

Thank you for your purchase and your confidence in us.

It is important to read what follows in order for you to fully benefit from your purchase.

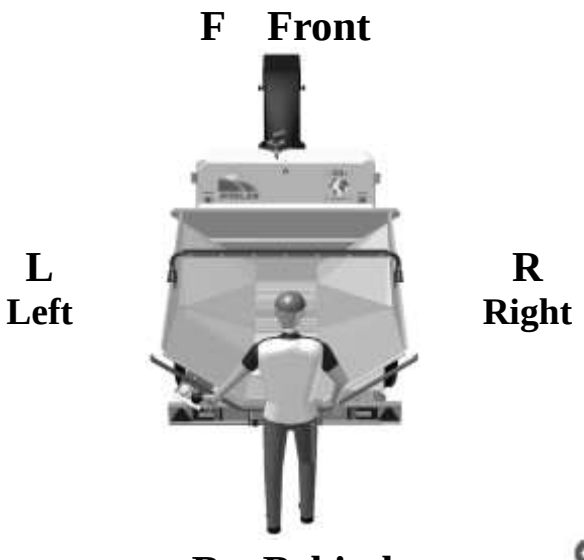
Although this machine is simple and easy to use, we recommend reading this manual before starting to use it.

In order to operate your multi-vegetation chipper in a safe, efficient and effortless manner, you need to be familiar with the instructions for operation, maintenance and problem-solving that are described in this manual.

This manual describes all the functions of the **VIPER** chipper. Keep it within reach for later reference. Please contact your reseller for more information, technical data or if you want to order an additional copy of this manual.

Safety precautions:

This machine is **only suitable** for **chipping vegetable waste.** It may not be operated by persons **younger than 16.**
The machine should only be used by persons who have a **good physical condition and a certain technical knowledge.**
Maintenance must be done by a **qualified technician.** All interventions for assembly, disassembly and/or specific maintenance must be handled by a recognized distributor. Before working on the VIPER for maintenance or other purposes, **please remove the ignition key.**
Position of the operator: left, right, in front of and behind in this manual are as seen by the operator from his work station, facing the hopper.



INTRODUCTION

Safety instructions

This machine is **only intended for crushing and shredding plants.**
Besides shredding wood and plants, the **VIPER** shredder cannot be used for any other purpose.
The shredder should only be used by people over **16 years of age.**

This machine can only be used by someone who is **in good physical condition and who has some technical knowledge.**
Maintenance and repair work should be done by a **qualified technician.** Assembling, disassembling and/or specific maintenance work should be performed by an authorized dealer.
Before beginning work or proceeding to maintenance of the **VIPER**, **always remove the ignition key.**
Proceed to maintenance by scrupulously following the instructions.
Eliminate pieces of metal, plastic, rubber or any other materials that may have been mixed with the wastes.
Always use protection goggles, work gloves and protection against noise;
The machine can in no case be used to transport equipment, material or people.
The machine cannot be used to push or pull anything.
Battery acid is very corrosive. Avoid any contact with the eyes, skin and garments. Immediately rinse eventual splashes with water and if the case arises, consult a doctor.
Before touching the electric circuit, always disconnect the cable connected to the battery's + terminal.
Always keep the battery out of reach of children.
When performing maintenance, do it in a sufficiently lit workshop.
Respect the safety standards prescribed in the motor's user and maintenance manual.
Keep children away while the machine is in operation or when performing maintenance work; Do not work in confined space. Do not run the motor in a non ventilated place (risk of CO^2 intoxication)

LOCATION OF THE SERIAL NUMBER

When ordering spare parts for replacement or if you need technical information, please always have with you the serial number of your **VIPER 50** shredder.

TS Industrie manufacturer's plate is on the front left chassis.

The serial number is located at the place indicated on the photo.

Serial number

GUARANTEE

The TS Industrie Company guarantees the parts of its **VIPER** shredders against any defect that could affect their operating. The guarantee applies in all the cases where the damage is not the result of improper use, abuse or negligence, accidental, act of God or any other circumstance beyond the control of TS Industrie. This guarantee extends over a period of one year starting on the date of delivery to the customer and is limited to the replacement of defective parts and/or of labour.

GUARANTEE CLAIM

A claim in due form shall be presented to TS Industrie, by the origin purchaser for inspection by an authorized representative of the company.

This guarantee does not apply to a shredder that has been modified out of our workshops and that, according to TS Industrie standards, would be affected in its operation, its safety and its service life.

This guarantee does not cover parts and accessories that are already under their manufacturer's guarantee and the servicing of which is covered by the latter's administration. Service items such as lubricants, belts, paint and similar are not subject to guarantee.

USER MANUAL

The purchaser acknowledges having received instructions concerning the correct operation of the shredder and also acknowledges that TS Industrie cannot assume any responsibility resulting from the use of his product other than that described in the user manual supplied at the time of the purchase.

DO NOT FORGET TO REGISTER YOUR GUARANTEE OTHERWISE IT WILL BECOME INVALID.

SAFETY

You are responsible for the safe use and the maintenance of your plant shredder. You should thus make sure that whoever uses, maintains and works with the appliance has knowledge of the operating and maintenance methods as well as the safety measures to apply as described in this manual. The user manual informs you on the security practices to apply when using the plant shredder.

Remember that you are the person in charge of security. Efficient precautions will protect you as well as those around you. Make sure that ANYONE working with this appliance knows how to operate and maintain it. It is very important to prevent accidents. to avoid injury, respect the security measures explained in this manual.

- Before using the plant shredder, an owner has the duty of giving the user instructions to operators or eventual employees.

- This equipment's most important safety device is a safe operator. It is an operator's duty to read and understand all the security and operating instructions and to scrupulously follow them. The best way of avoiding accidents.

- No one is supposed to handle the **MV VIPER** shredder if they have not read and understood the instructions on the subject. An operator without knowledge exposes himself and others to risks of accidents.

- It is not allowed to modify the equipment in any way whatever. Any non authorized modification could affect the operation or the security and eventually reduce the equipment's service life.

THINK CAUTION!

WORK IN COMPLETE SECURITY.

GENERAL SAFETY

1) Read and understand the user manual and all the security symbols before operating, maintaining, un-jamming or adjusting the shredder.

2) Keep a first aid kit in case of accident. Keep it in a visible place.

3) Keep a fire extinguisher within reach in case of need. Keep it in a visible place.

4) Use appropriate protection equipment. Here are a few suggestions, but do not limit yourself just to this description:

-Helmet and ear protection

-Work shoes with steel non-skid soles

-Protective goggles

-Work gloves and waterproof garments.

5) Never operate without the protector.

6) Keep people away and especially children, when you are using the shredder

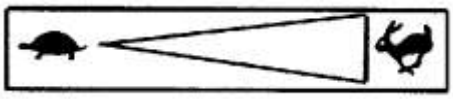
Meaning of the labels (cont.)

Attention! Grip wheel.

Never enter the hopper when the engine is running.

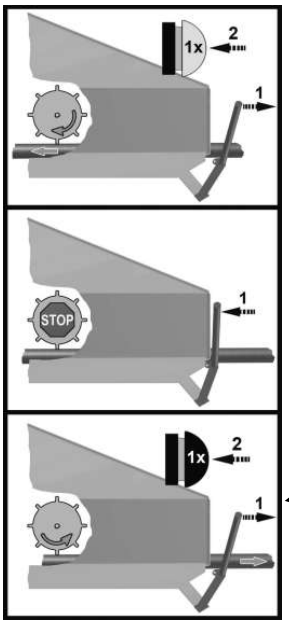
Never open or remove the inspection doors and carters of the cutting parts.

Minimum engine speed



Maximum engine speed

Lubrication point



<u>Rotation commands of the conveyor belt:</u>

Chipping material (forward operation)

Stop the rotation of the feed rolls

Releasing material (backward)

SAFE USE

1) Read and understand the user manual as well as all the security signs before any operating, servicing, adjusting, repairing or un-jamming manoeuvre.

2) Install and make sure that all the protectors and guards are well fixed before starting or working.

3) Keep hands, feet, hair as well as clothing out of reach of parts in movement.

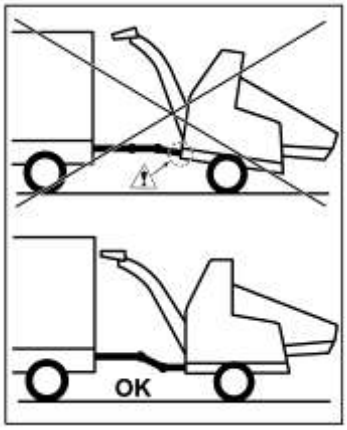
4) Before performing maintenance, adjustments, repairs or un-jamming of the machine, put the engine in idle speed with the accelerator handle, wait till all moving parts have stopped, stop the engine.

5) Place all controls to neutral before starting the machine.

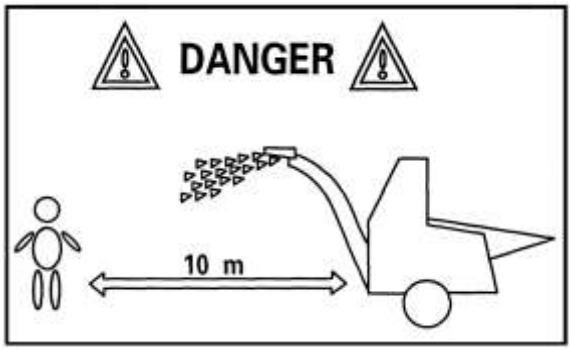
6) Keep people away, especially children before starting.

7) Use protections appropriate to the work to undertake.

8) Always couple the machine horizontally. To avoid making the machine swing, always work in a horizontal position if the machine is unhitched.



9) when shredding, risk of projections of chips within a 10 metres radius.



SAFE MAINTENANCE

1) Follow all the indications in the user manual concerning operating, maintenance and security.

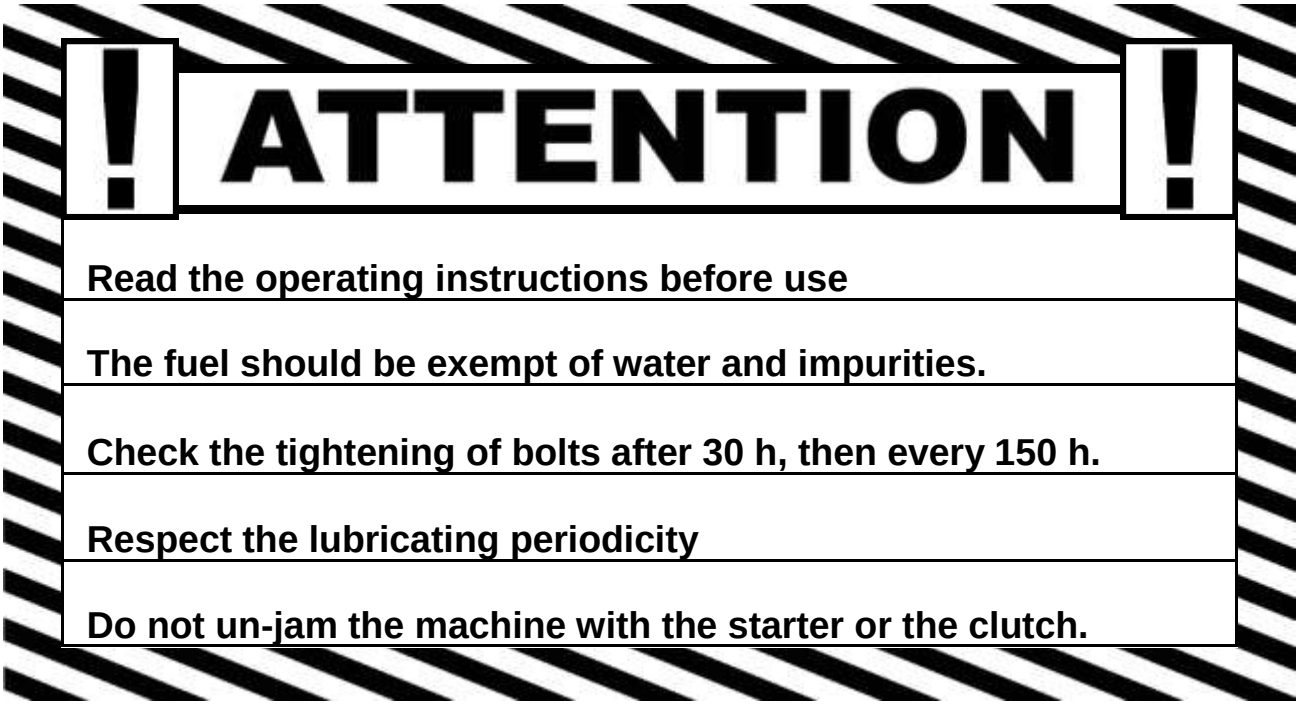
2) Before performing any maintenance, adjustment, repair or un-jamming of the machine, put the engine in idle speed with the accelerator handle, declutch the machine and wait till all the parts in movement have stopped, stop the engine, remove the ignition key.

3) Make sure that all the protectors and guards are efficiently fixed after performing maintenance or servicing the shredder.

4) **Warning!** Keep hands, hair and clothing out of reach of moving parts.

5) Install and make sure that all the protectors and all the guards are well fixed before starting or working.

6) Never wear badly cut, too loose or shredded clothing when working on command system components.

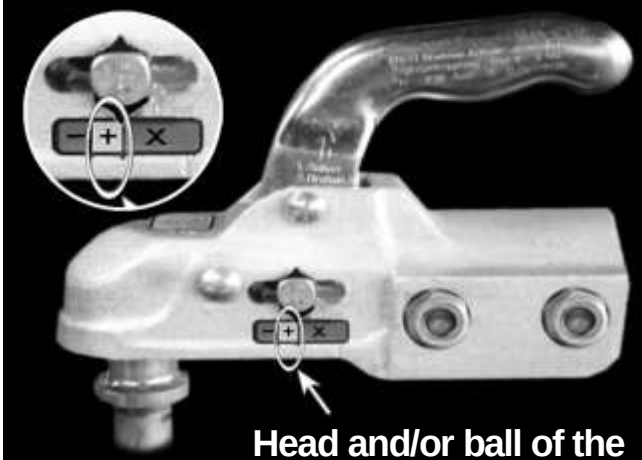

ATTENTION
Read the operating instructions before use
The fuel should be exempt of water and impurities.
Check the tightening of bolts after 30 h, then every 150 h.
Respect the lubricating periodicity
Do not un-jam the machine with the starter or the clutch.

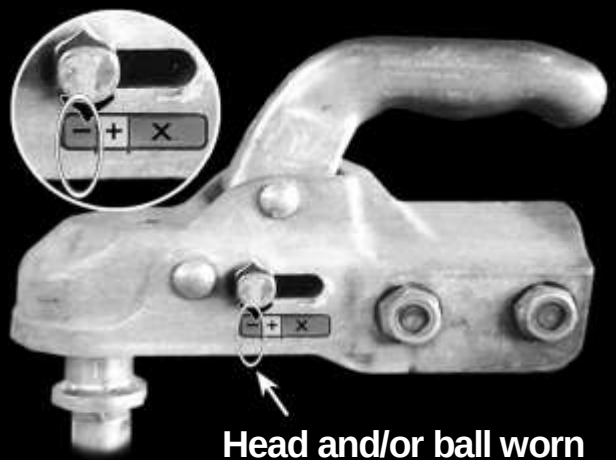
SAFE TRANSPORT

1) Follow the highway code in force.
2) Ensure that your equipment is always equipped with working signalling lights that are clean and visible to other drivers.
3) Reduce your speed on country roads and bumpy surfaces.

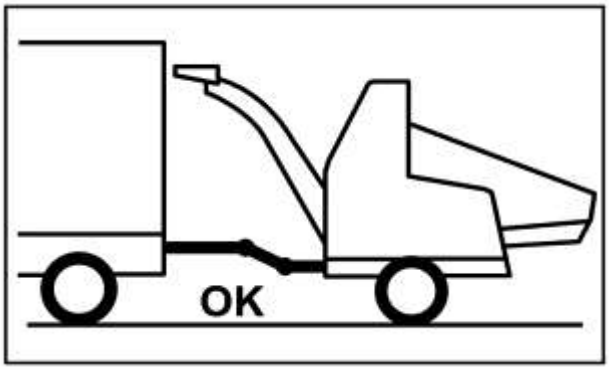
<u>Wear of the coupling:</u>
Check the wear indicator when coupling the machine.
Systematically repleace the had and/or the ball of the coupling of the vehicle if the indicator is in the MINUS zone. You might loose the chipper on a bump in the road or against a border.

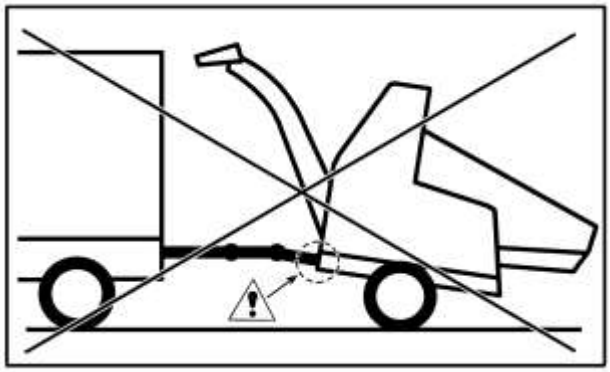
<u>YOU ARE RESPONSIBLE IN CASE AN ACCIDENT HAPPENS.</u>





<u>Hitching to a vehicle</u>:
Always hitch the shredder in a horizontal position in order to prevent the machine from tipping backwards <u>AND</u> check that the tow bar's nut joints are secure on a daily basis to prevent jolting which would damage the hitch and tow system and reduce its lifespan.





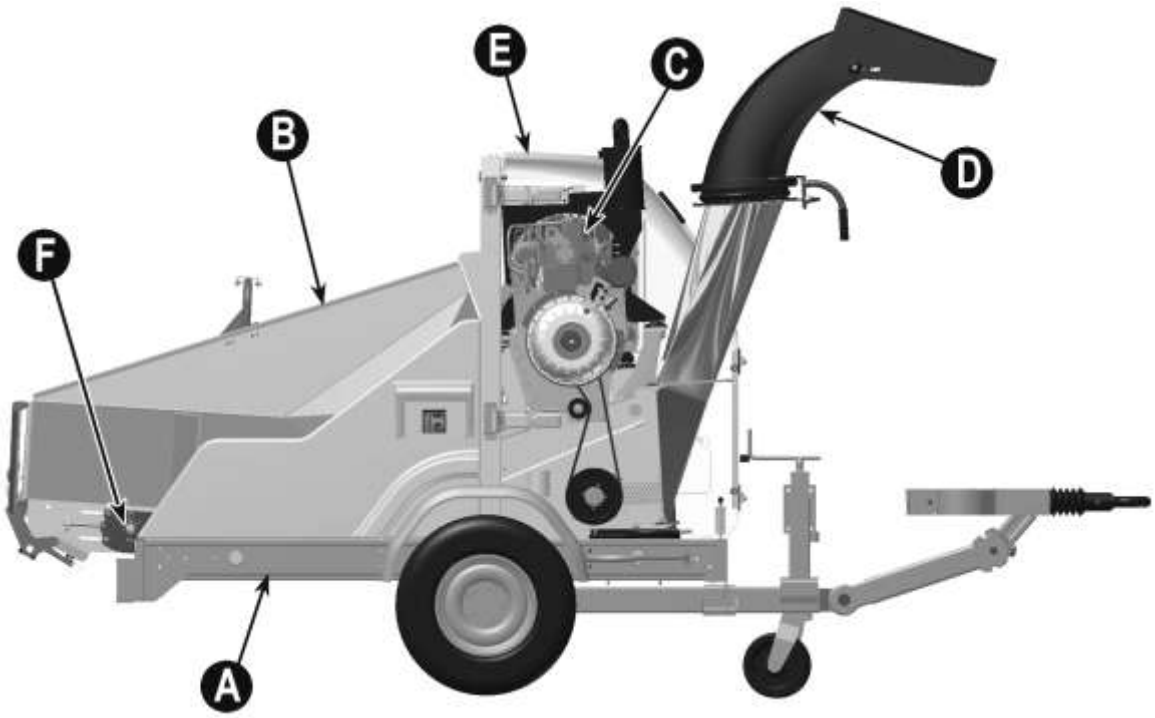
GENERAL DESCRIPTION AND OPERATION

DESCRIPTION

The **TS Industrie VIPER multi plant shredder** is intended for the shredding of plants and branches up to 6,70 inchs (170 mm) in diameter.

The machine includes the following main components:

(A) : the chassis
(B) : the shredding unit
(C) : the engine and its various transmissions
(D) : the evacuation shaft
(E) : the soundproof cover
(F) : the metallic feed belt



GENERAL DESCRIPTION AND OPERATION

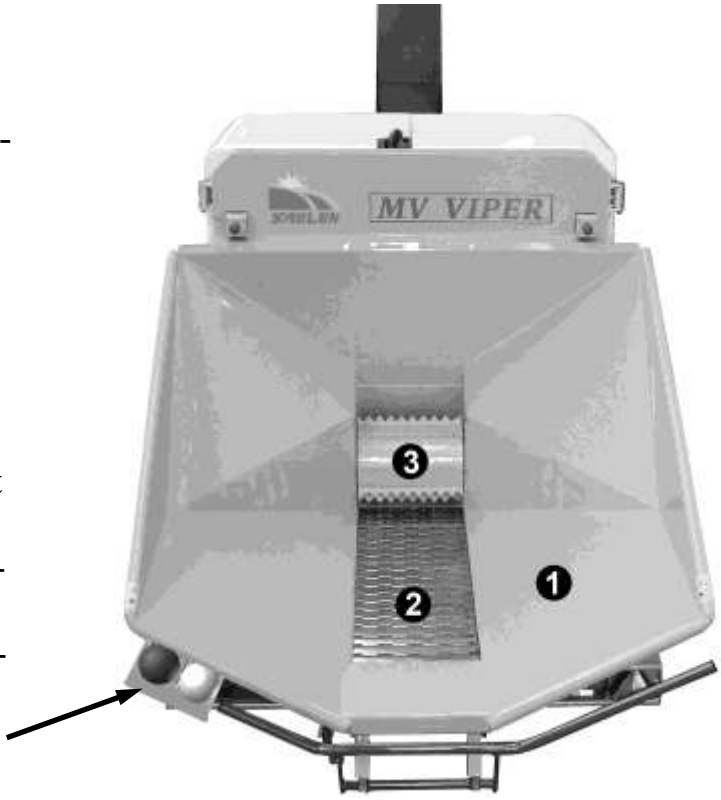
A. The chassis.
The shredder's chassis serves as support to the various components of the VIPER. It allows moving the machine independently.

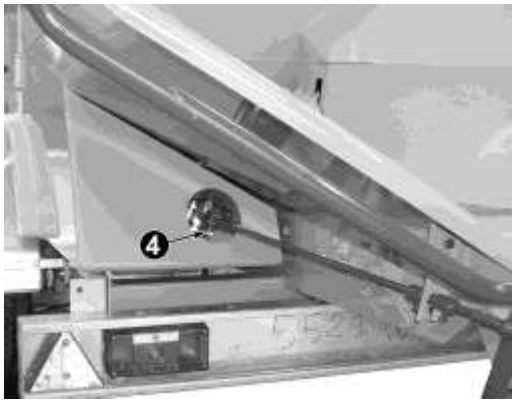
B. The shredding unit.
It is composed of a feed hopper **(1)**, a metallic belt **(2)**, a feed roller **(3)** with serrated bars and a rotor that shreds materials.

1) Feed belt and roller:

They lead the material at constant speed toward the shredding rotor. An anti-jam system stops it when the rotor's speed descends too low (jamming at shredding level), they are automatically put in rotation when the rotor regains sufficient speed to shred correctly.

They can be activated in both rotation directions (forward and reverse run) With red or black and yellow push buttons a the backside of the feed hopper Their rotation speed is adaptable with a tooth wheel (4) at the left backside of the security cover and will depend on the diameter of the material to shred





2) Shredding rotor:

Key element of the machine, it shreds the matter brought by the feed roller.
It is put in rotation by progressively activating the clutch levier.
Its speed is set.

C. The engine and its drives

The diesel heat engine is located above the shredding unit, it supplies the energy needed to drive the rotor and to drive the hydraulic circuit's oil pump.

It is a four-cylinder Kubota diesel engine. It develops 50 HP at 2900 rpm. For any additional information on this engine, please refer to the manufacturer's manual.
The outlet shaft is equipped with a pulley activating 3 belts that drive the shredding rotor's rotation.

The hydraulic circuit's oil pump located on the diesel engine; activates the hydraulic drives of the belt/feeder unit.

OPERATING OF FEEDER CONTROLS

The VIPER is equipped with an electric command hydraulic distributor activated by 'mushroom' pushbuttons for the forward and reverse drives and a red 'hand rail' command bar for stopping the feed roller / belt unit.

REM: to make the feed roller / belt unit run in forward drive the engine's speed should be at its maximum

FORWARD RUN COMMAND

1: To make the feed roller run in forward drive the red handrail should be pulled backward
2: Press the **yellow** pushbutton to make the feed roller run in forward drive

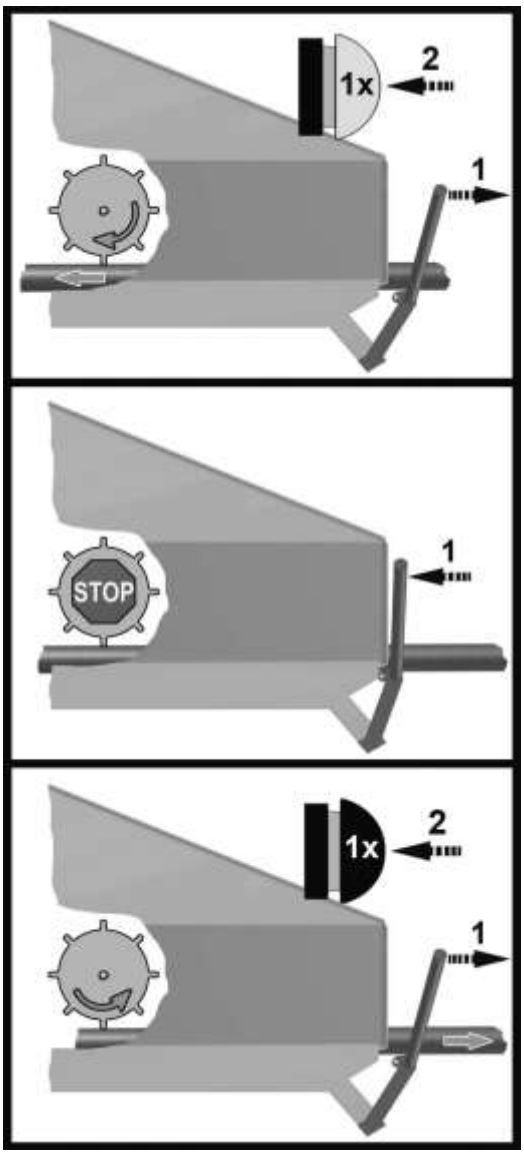
FEEDER STOP COMMAND

1: Push the red handrail to stop the feed roller.
(the handrail can be locked in pulled position and in pushed position)

REVERSE RUN COMMAND

1: To make the feed roller run in reverse drive, first pull the handrail backward
2: And press the **black** pushbutton

REM: the feeding cell can be switched directly from forward to backward operation and vice versa without using the operating handle.



STARTING

CHECK BEFORE STARTING

Every operator should read and understand all the inscriptions and should follow the safety measures described in this section for sure and efficient shredder operating. A checklist prior to use is supplied to the user. It is important to take it into account for the security of all as well as to keep the machine in good condition.

The following points should be checked before using the machine:

1) Is the machine sufficiently lubricated according to the lubrication plan indicated in the user's manual.
2) Check the different levels for the engine, being:
   the engine's oil level
   the radiator's water level
   the gas oil level
3) Check the hydraulic circuit's oil level.
4) Make sure the air filter is clean.
5) Make sure the engine's radiator is not clogged up.
6) Make sure the covers are all closed and locked.

STARTING

WARNING!

If for an unknown reason the shredder has difficulty shredding the material, and that you have to stop it: **do not start the engine again without having eliminated the cause and cleared the material out of the shredding rotor!**

PUTTING IN SERVICE

1) Check that the cap at the top end of the shaft is open.

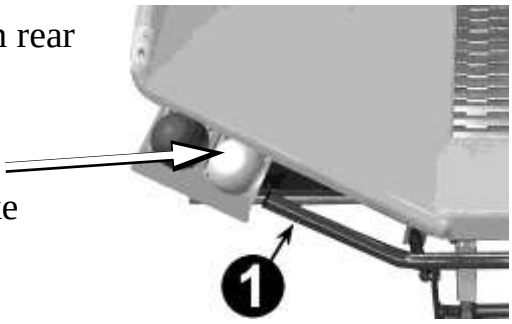
2) Place the engine's accelerator handle at idle.

3) Preheat and start the engine by turning the ignition key.

4) Slightly accelerate the engine's speed. Let the engine's temperature rise.

5) **Progressively** engage the rotor's clutch handle upwards.

Make sure the cutting rotor is placed in rotation and that it is not jammed by residual material . Never try to clear it with the clutch, which would prematurely damage it ***(see stopping advice on the next page et page 45)***



6) Pull the control bar **(1)** stopping the feeder right home in rear position .

7) Put the feed roller in rotation by activating the yellow control pusher located on the rear left of the branches intake hopper.

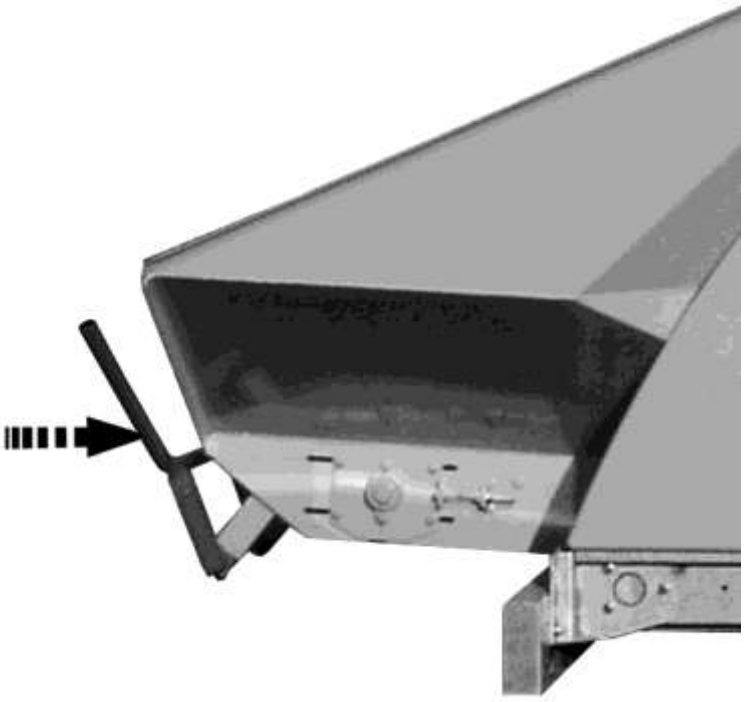
8) Start shredding.

STARTING

STOPPING

1) **<u>Let the shredder empty itself for a few minutes to eliminate residual materials behind the feed roller and inside the shredder, which could jam on the rotor at the next start.</u>** ***(see advice page 45)***

2) Put forward the control bar to stop the feed roller and the carousel.



3) Progressively bring back the throttle lever to idle.

4) Stop the engine by turning the ignition key on the control panel.

MAINTENANCE

MAINTENANCE SECURITY

1) Put the parking brake on, remove the ignition key and wait till all the moving parts have stopped before performing maintenance or repairs.
2) Make sure you put back all the protection screens after servicing.

LUBRICANT quantities:

Diesel motor: 9,5 L.
Fuel: 45 L.
Hydraulic oil: 24 L.
Hydraulic meter oil: 2,4 L.
Hydraulic reductor feed roller: 1 L.

Recommended LUBRICANT:

1) Lubricant for the hammers of the rotor:
You **must** use a water-resistant lubricant of type NLGI grade 2
"SAELEN BIOPLEX "

2) Lubricant for bearings, transmission belts and different organs:
Use a versatile high grade SAE lubricant that is compatible with extreme pressures
"SAELEN BIOPLEX "

3) Hydraulic oil:
Use oil AFNOR NFE 48600 Types HV iso VG 46
"MINERVA BIO HYDRO 46 "

4) Oil for hydraulic coupling
Use oil AFNOR NFE 48600 Types HV iso VG 46
"MINERVA BIO HYDRO 46 "

5) Engine oil
Use SAE 15W40 which complies with the standards: API CH4-CG4-CF
"MINERVA POWER LONG WAY 15W-40 "

6) Oil feeding reduction valve:
SAE 90 EP

MAINTENANCE

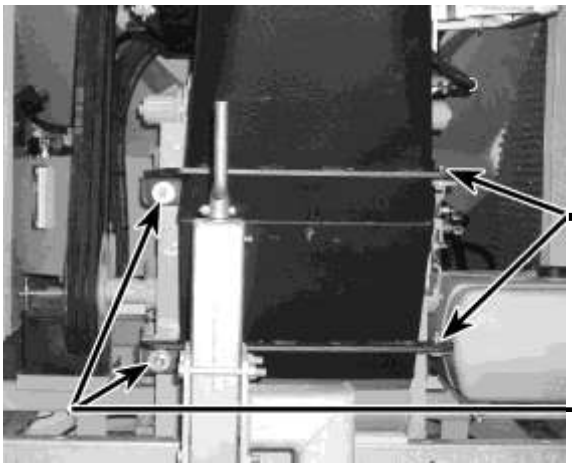
MAINTENANCE PERIODICITY

# of hours	Servicing
Daily	-Check engine's oil level -Check radiator's water level -Check air filter's degree of clogging -Check radiator's degree of clogging
Every 15	-Lubrication of rotor's hammers
Every 50	-**First** engine oil change -Lubrication of the rotor's two rotations -Cleanliness check of the air intake under the rotor -Check if blades and hammers -Check tension of rotor drive belts -Lubrication of feed roller's rotation -Check level of hydraulics oil -Check metallic belt's tension (the first time at 8h)
Every 150	-Engine oil change (or once a year) -Lubrication of the metallic belt's forward and reverse rollers -Lubrication of feeder articulation axis bearings -Replacement of hydraulic oil filter **the first time** and afterward every 500 hours (or every 2 years) -Check of counter-blade wear -Check and remove the branches winding around the bearings' axes and the hydraulic motors -Check tightening of coupler head's articulations
Every 300	-Replacement of gas-oil filter -Check of belt and slide plate wear -Check battery's electrolyte level -Check tension of alternator's belt -Check oil level of feed roller gearbox
Every 400	-1st coupler oil change , then every 1000 hours (or every 2 years)
Every 500	-Change hydraulic oil (or every 2 years) -Chance hydraulic return oil filter (or every 2 years) -Change hydraulic oil suction strainer (see page 40) -Change feed roller gearbox oil

LUBRICATION POINTS

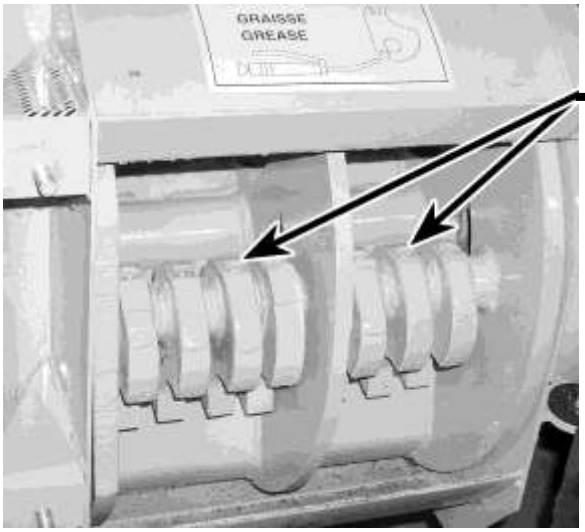
Proceed to the lubrication and maintenance of the machine engine stopped and ignition key removed.

LUBRICATION OF HAMMERS:



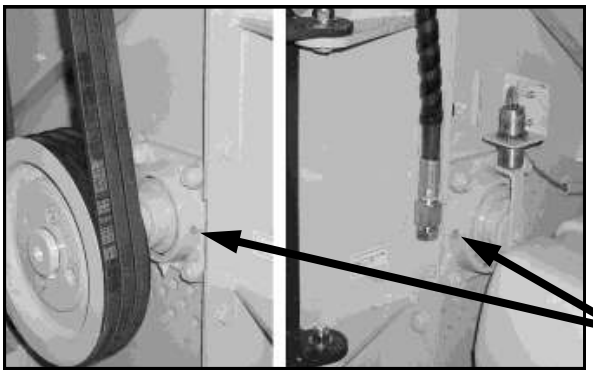
To access the rotor:
-Remove the two Nylstop locking nuts

-Open the evacuation shaft by making it pivot on its two hinges.



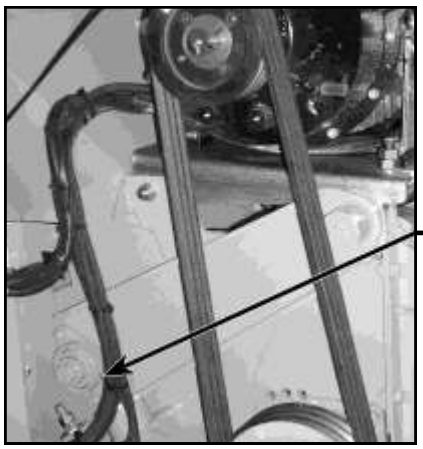
-Clean the lubrication holes at the rear of the hammers with a small screwdriver or an air gun.
-Lubricate the 14 hammers
lubricant of type NLGI grade 3 compulsory

note: Do not grease excessively; ~2 pump shots per lubricator are sufficient. Excessive lubrication would entail at the rotor's rotation, the centrifugation of excess grease against the shaft's inner wall and deficient sliding of shredded matter.)



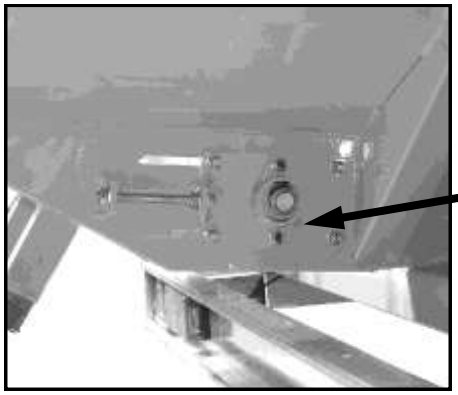
LUBRICATION OF THE ROTOR'S ROTATION BEARINGS

LUBRICATION POINTS



LUBRICATION OF THE FEED ROLLER'S BEARING

LUBRICATION OF THE TWO BEARINGS OF THE BELT'S FRONT ROLLER



LUBRICATION OF THE TWO BEARINGS OF THE BELT'S REAR ROLLER

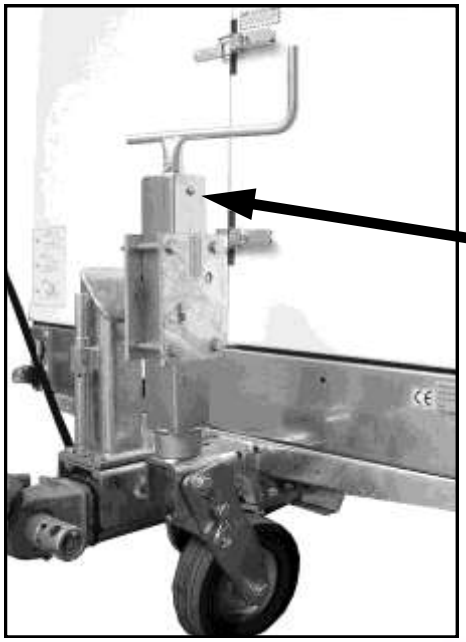
LUBRICATION JOINT AXLE ARM FEED ROLLER

MAINTENANCE

LUBRICATION POINTS

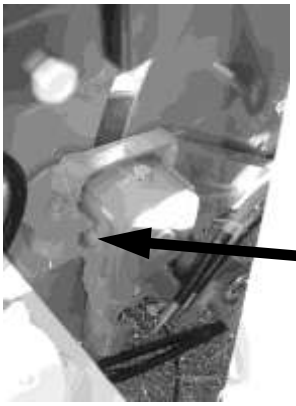
LUBRICATION OF FEEDER ARM'S ARTICULATION AXIS

COUPLER HEAD'S BRAKE LINKAGE

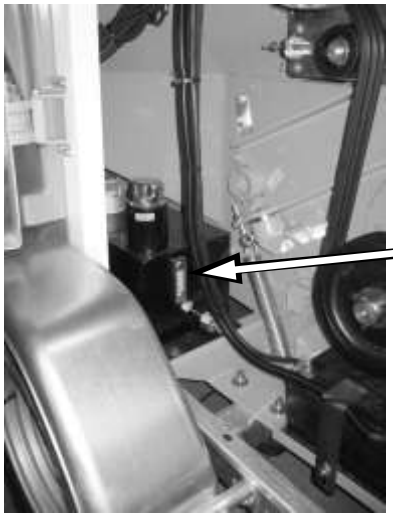


ADJUSTABLE JOCKEY WHEEL

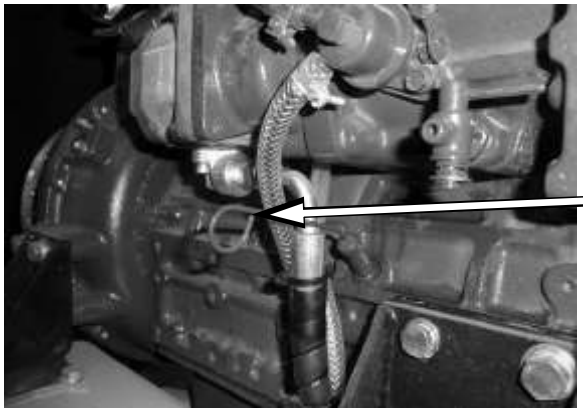
OIL LEVELS



FEEDER REDUCTION GEAR LEVEL
(Oil should slightly flow at the cap's orifice)

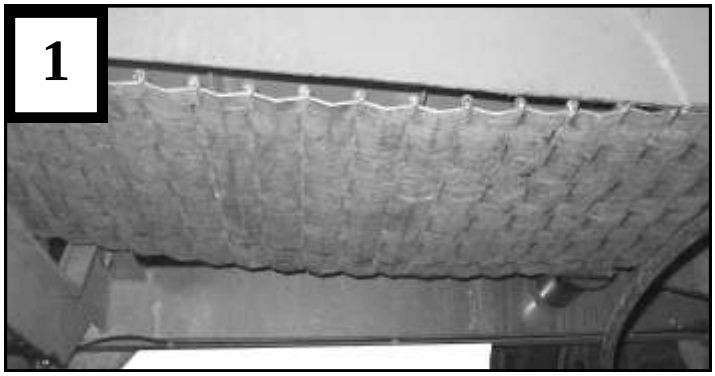


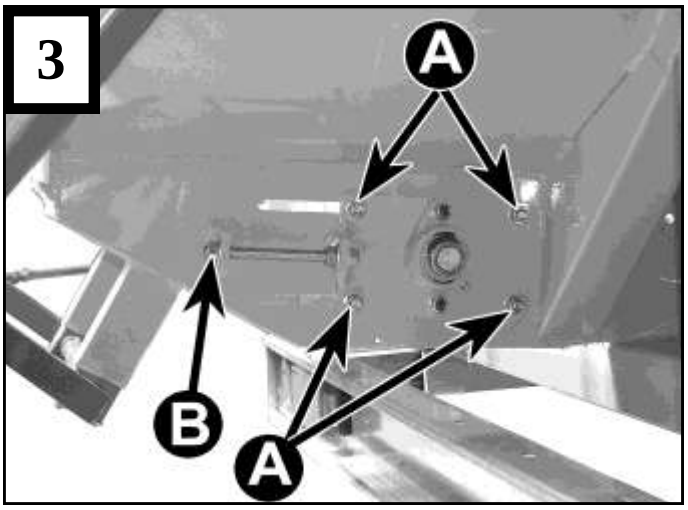
HYDRAULIC TANK LEVEL



ENGINE'S OIL GAUGE
(to change oil see page 56)

SETTING THE METALLIC BELT'S TENSION





For good belt engagement, check its tension after 8h and regularly afterwards.

1 Belt correctly tightened

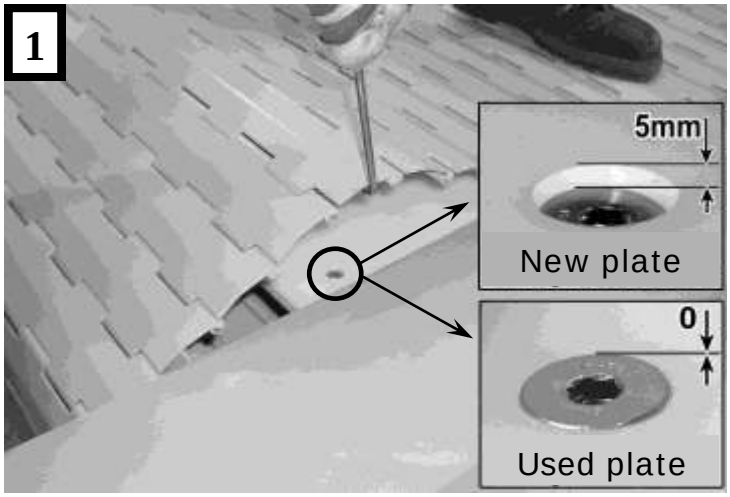
2 Belt loose

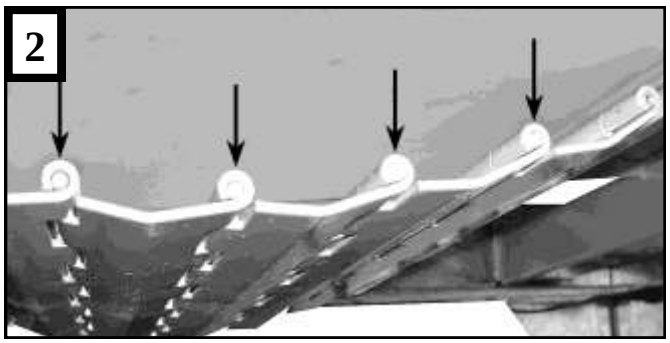
3 To tighten the belt loosen the 4 screws on either side rep. **(A)** and simultaneously tighten the tightener rep**. (B)** so that the belt is parallel to the unit's base (see photo 1). Retighten the screws **(A).** After tension, run the belt several times in forward and reverse directions to make sure it remains in line. (Before tension make sure the belt is well centred in the hopper)

Rem.: do not tighten too much, a good grip of the feed roll and belt does not require excessive tension.

MAINTENANCE

BELT AND SLIDING PLATE CONTROL



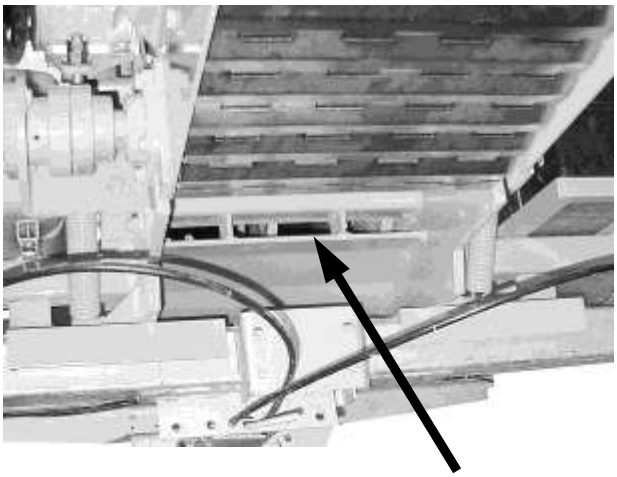


To check the wear of the belt and of the self lubricating polyethylene sliding bearing, completely slacken the belt, lift it with a hook and check:

1 the bearing's thickness above its four attachment screws

2 the wear of the belt's strips

THE ROTOR'S AIR INTAKE VENTS



The VIPER has another air intake under the rotor in addition to the usual two in order to improve the rotor's ventilation so as to optimise the ejection of shredded matter at the shaft's outlet

Regularly check the cleanliness of the three air intakes so as to optimise the ventilation and the ejection of shredded material.

DISASSEMBLY FOR REPLACEMENT OF BLADES AND HAMMER PELLETS

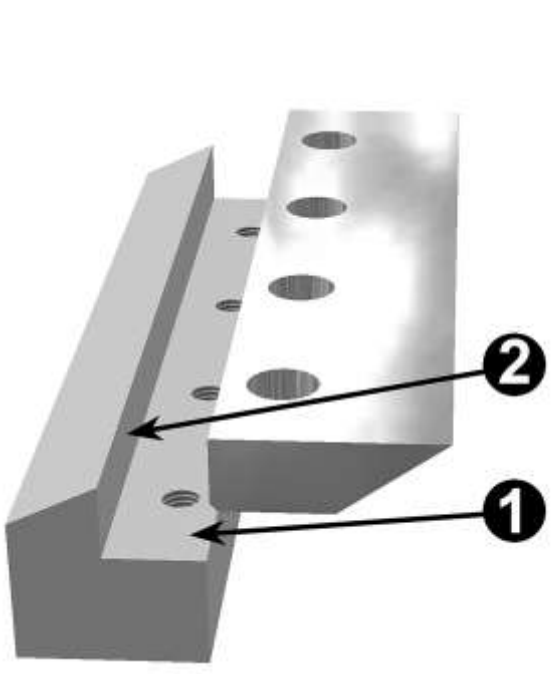
Imperatively remove the ignition key for this type of servicing.

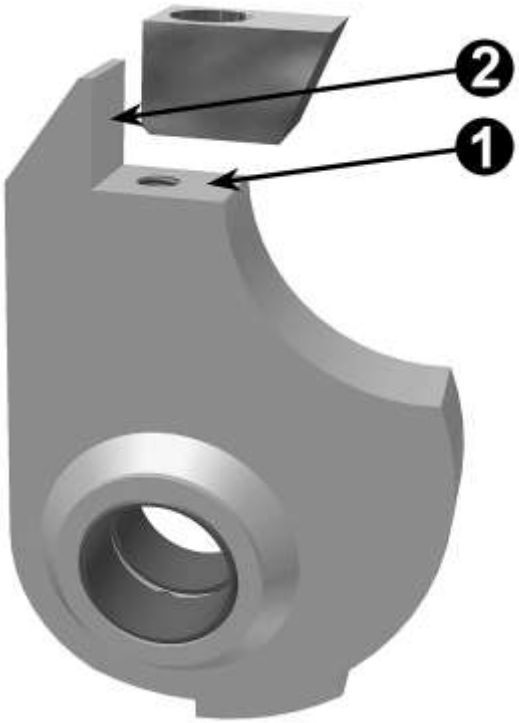
-The hollow hexagonal screws of the blades and hammer inserts are mounted at the manufacture **without Loctite at a torque of 16 M. Kg (157 N.m).** Use the appropriate wrench that is in good condition to remove them.

-Open the chute as described on previous page.

-Remove the screws from blades and inserts. (For the assembly later on, only use the news screws **category 12.9**).

-Clean the contact surfaces of the blades and the inserts clean at the base **(1)** as well as the wall **(2)**.

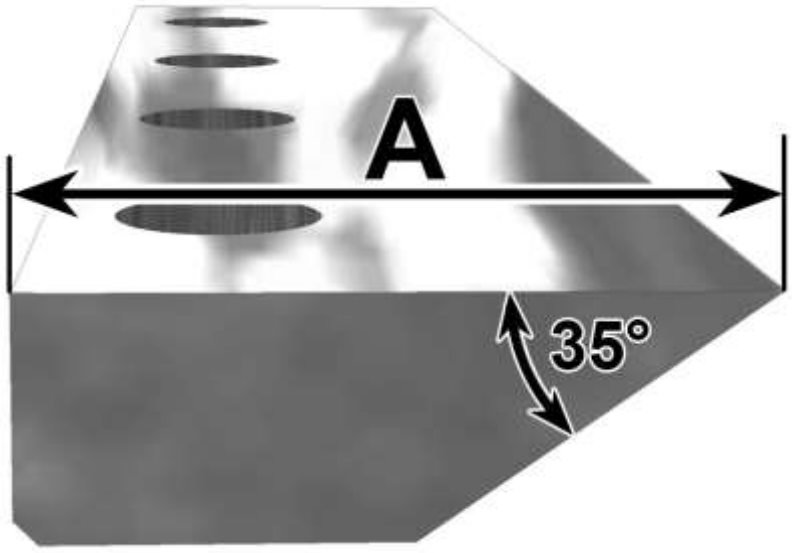




MAINTENANCE

-Remount sharpened or new blades of identical weight.

IMPORTANT: Sharpening should be done by a professional on a machine specially adapted for that, and not with a grinding machine.
Also see to it that the angle of 35° of the cutting edge is respected.
The minimum length **(A)** after sharpening should not be inferior to 50 mm. (The length of a new knife is 60 mm).



-Tighten the screws class 12.9 to 16 M.kg torque (157 Nm)
and make sure the blades and inserts lean against the wall.

-Grease the axes of hammers (~2 grease gun shots per hammer).

-Close the shaft and the hoods.

-Start the engine and let it rise in temperature for a few minutes.

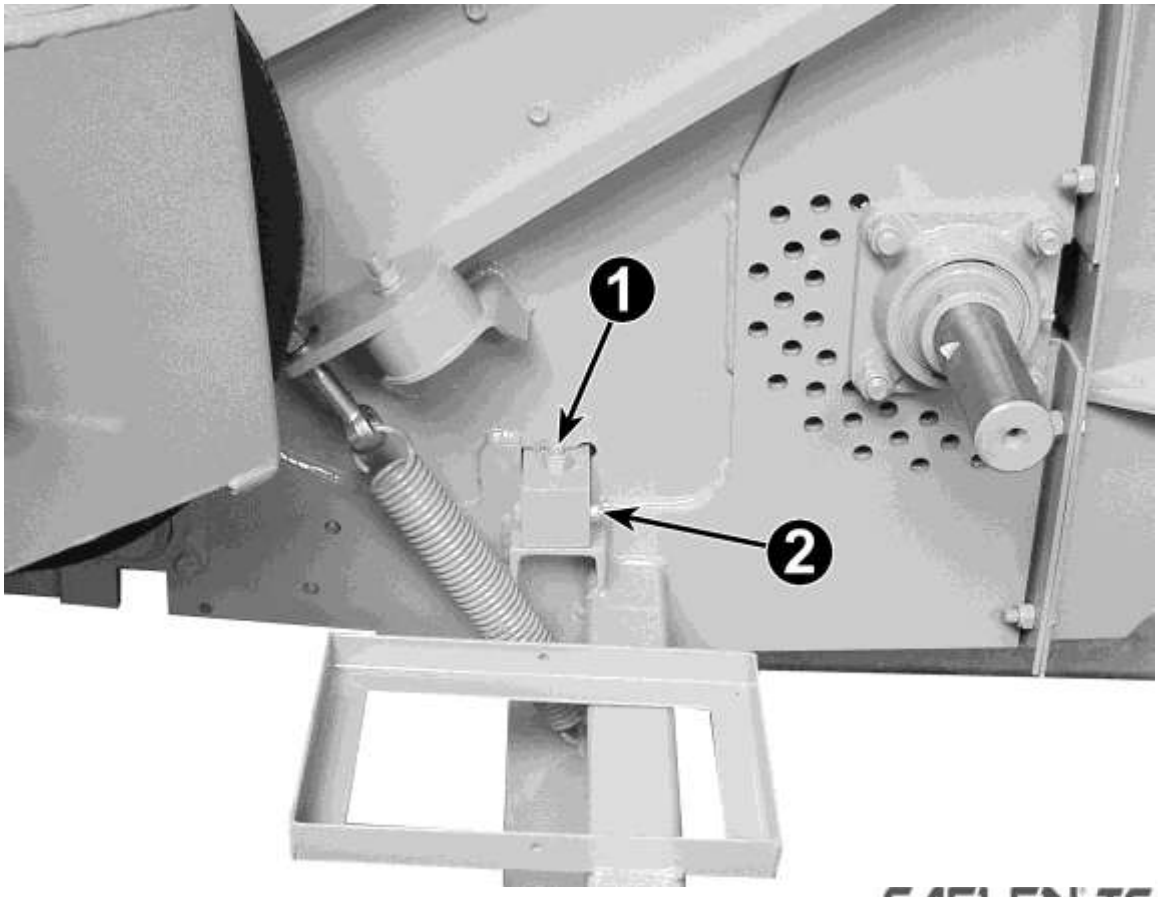
-Put in the rotor in gear progressively and accelerate up to maximum speed to make sure that no abnormal vibration disturbs the machine's operation.

DISASSEMBLY TO CONTROL THE COUNTER-BLADE

Imperatively remove the ignition key for this type of servicing.

-Remove the two attachment screws **(1)** at each end of the counter knife.
-Remove the two safety bolts **(2)**
-Drive the knife out by sliding it in its housing on either side. If the edge is worn out remove the wheel and the mudguard; take the counter-knife out of its housing, and remount it by shifting it by a half turn so as to show a new edge facing the knives.

(The counter-knife can be taken out on the right or on the left side)
(Each of the counter-knife's four edges that can be used)

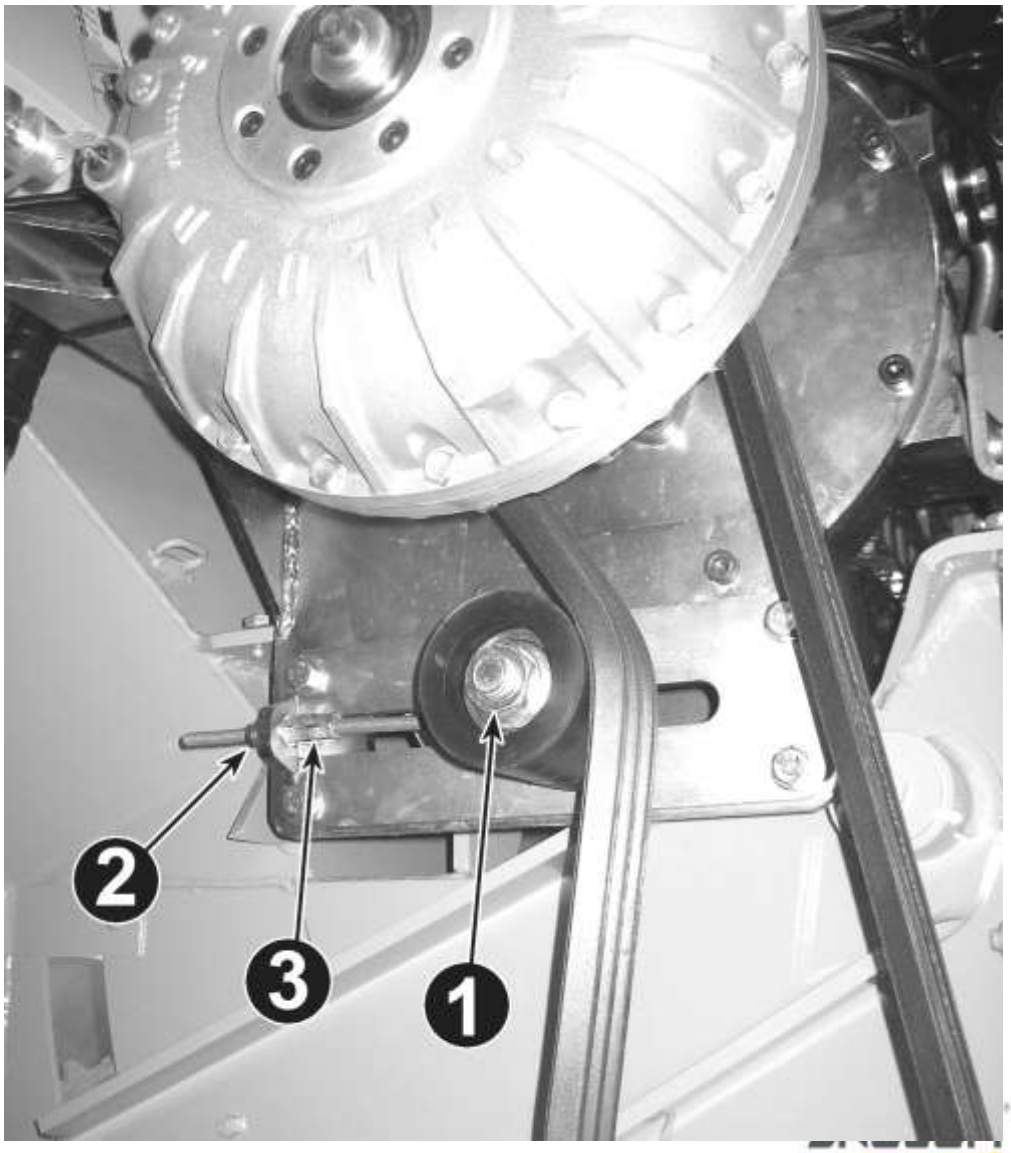


ADJUSTMENT OF THE ROTOR'S BELTS

The rotor's belts are permanently kept extended by an extender.

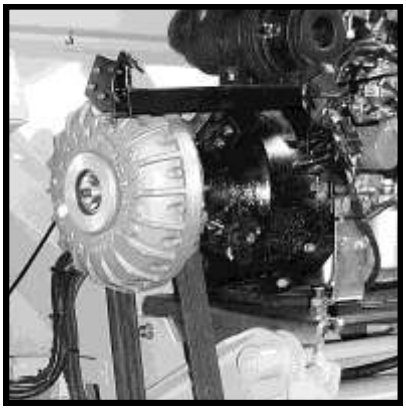
To tighten the belts, loosen the nut **(1)** of the tensioner, loosen and remove the nut cons (2) of the tension screw, move forward the tensioner using the nut **(3)** .
After belt tension, tighten the nuts **(1)** and **(2).**

This procedure should be carried out by a qualified technician.

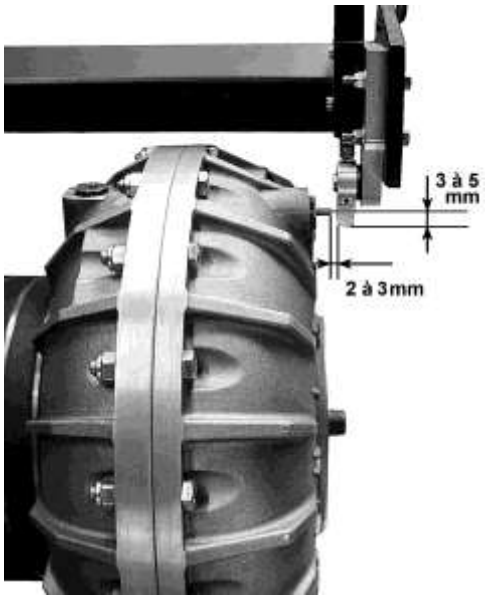


MAINTENANCE OF HYDRAULIC COUPLER

The VIPER is fit out with a hydraulic coupler that needs no special maintenance with a usual functioning.



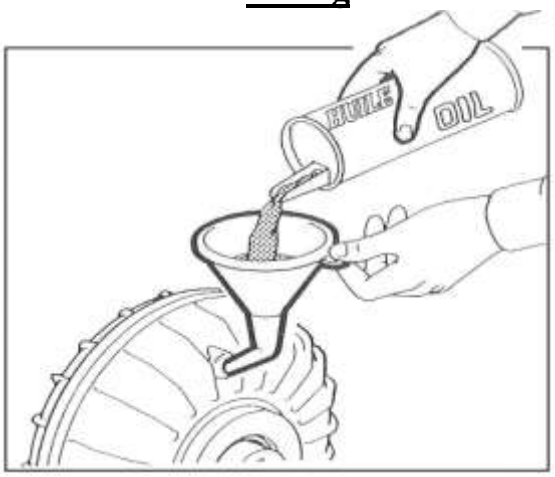
Positioning of the security contactor



Oil change

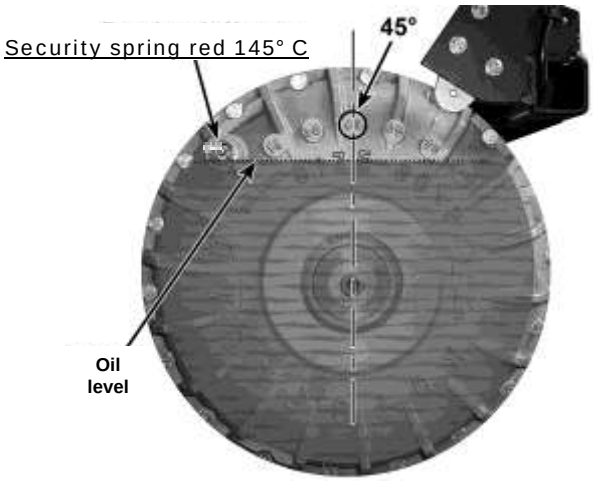
Change the oil via the green cap ***(First purge the couplyng by unscrewing the top cap)***

Filling



Refill the oil (1.14l.) by the detention stopper or the green fuse cap

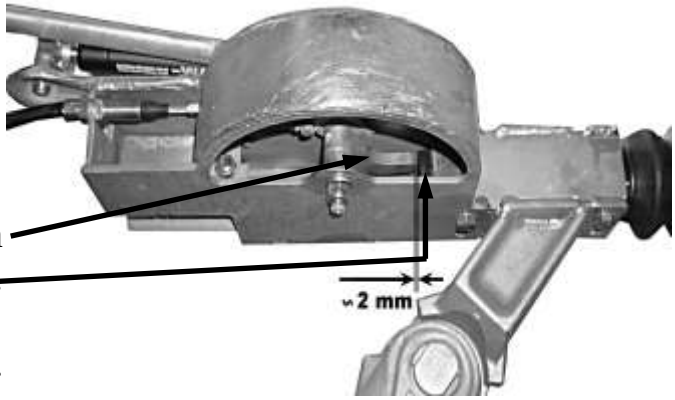
Oil level



Place the mark **45** (corresponding to a filling of 45°) vertically to the axe of the coupler. Remove the detention stopper, for the right level the oil must be just under the hole

ADJUSTMENT OF BREAKING TRANSMISSION

-Place the brake lever in released position.



-Check the clearance between the latch activating the brake cable and the push piston.

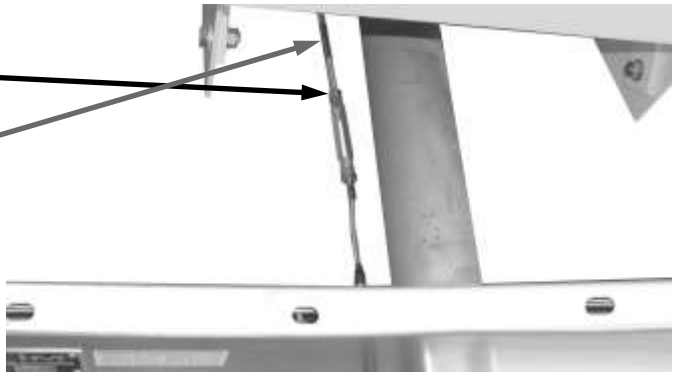
The clearance should be about 2mm.

-To adjust the clearance; act on the tightener:

*loosen the nut. ⚠ (left hand thread)

*turn the rod till you obtain the desired clearance.

*retighten the nut



DESCRIPTION AND MANIPULATION

ENGINE DASHBOARD

A : Green warning light functioning OK (If flashing, the engine stops after 10 seconds)

B: Warning light battery load

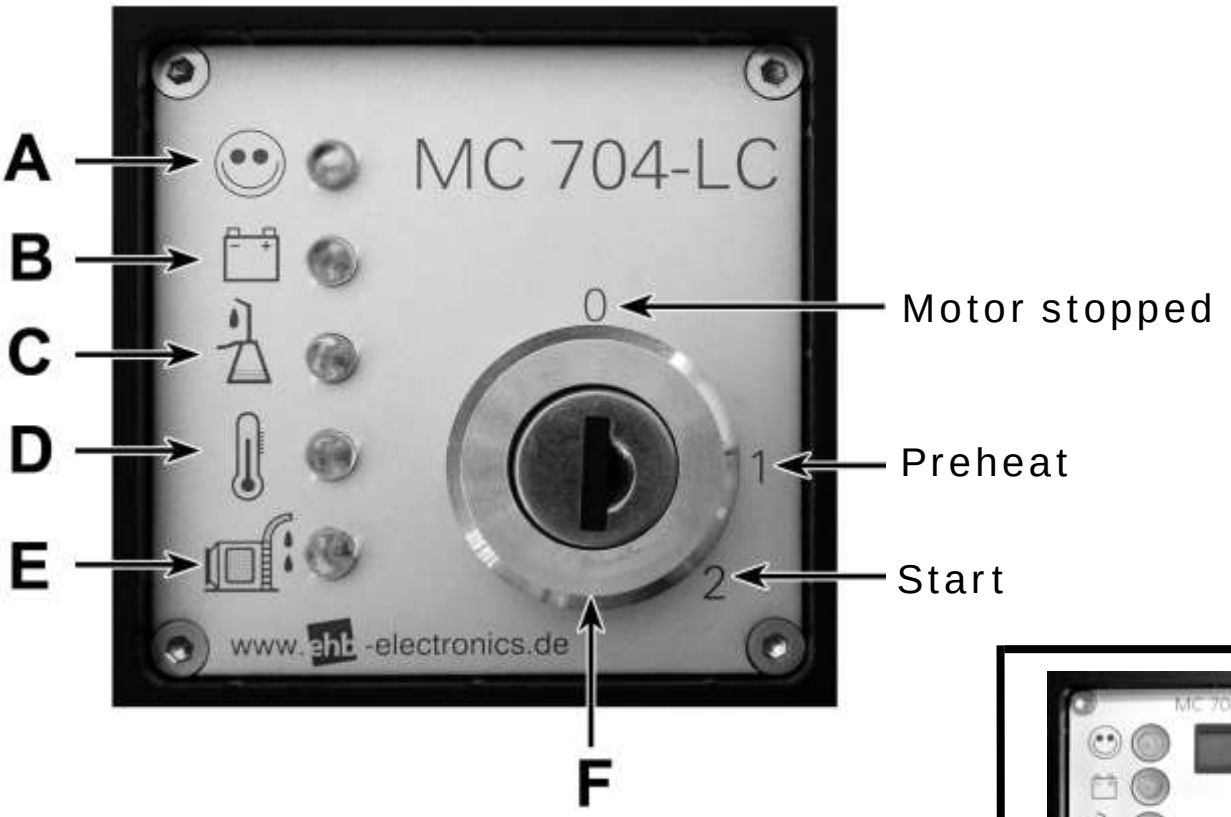
C: Warning light oil pressure

D: Warning light water temperature

E: *no utility* or preheating 8 seconds

F: Key switch

The engine is stopped automatically if warning light C and D indicate a problem



Do not add the key of the chipper to a heavy key ring; during functioning this could interrupt the contact. The functioning in F and B direction of the belt/feed can be reset and the power supply to the engine can be interrupted.

THE RESERVOIRS

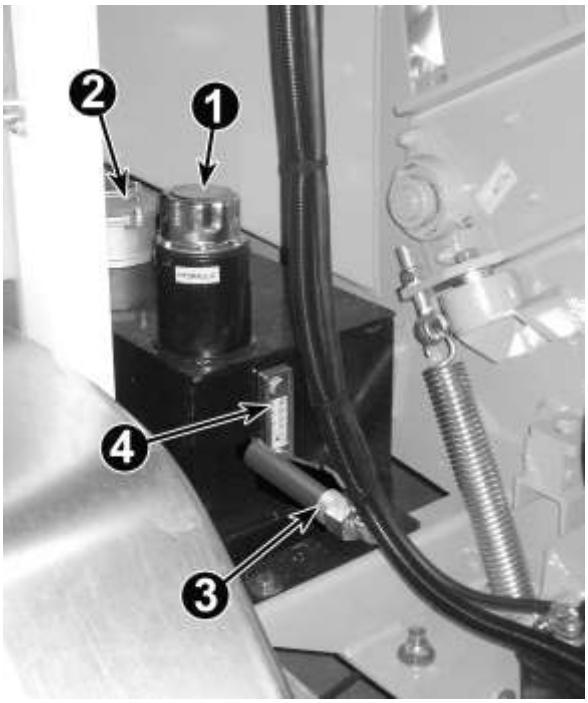
The machine has two reservoirs:
-the **hydraulic oil reservoir** including:

-The filler cap **(1)**

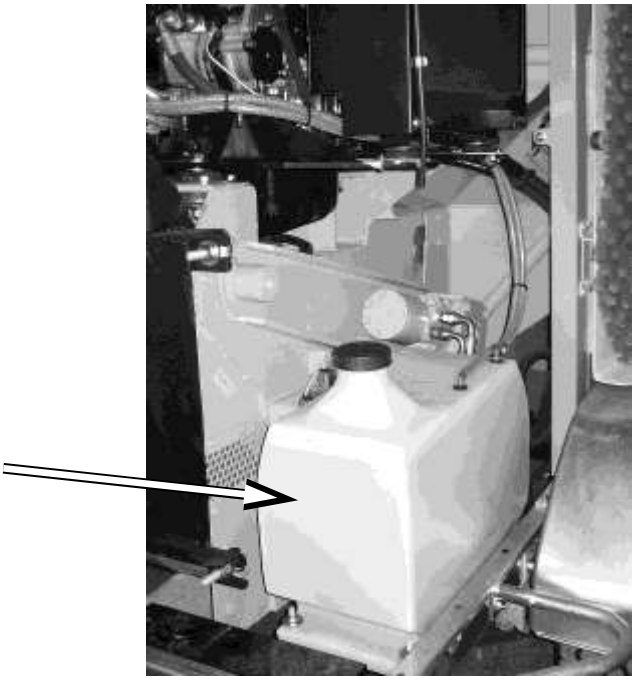
-Hydraulic filter on return **(2)**

-The hydraulic filter suction **(3)**
(accessible by removing the suction port)

-The level gauge **(4)**



-The **transparent gas-oil reservoir** 45 l.



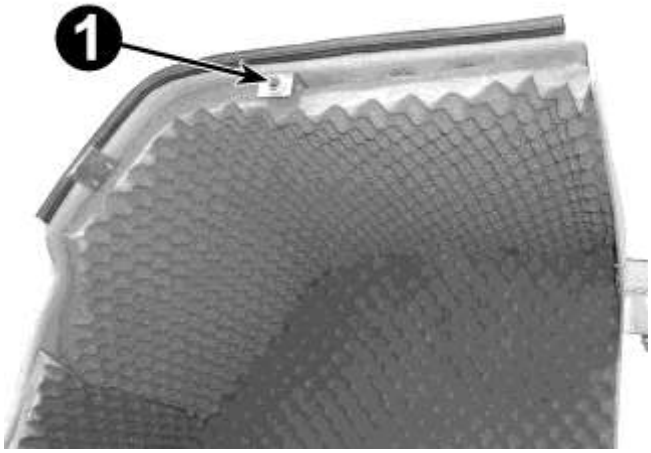
DESCRIPTION AND MANIPULATION

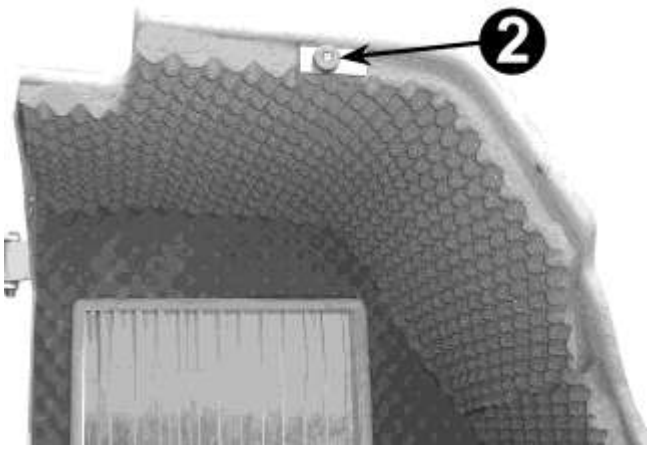
SAFETY HOUSING

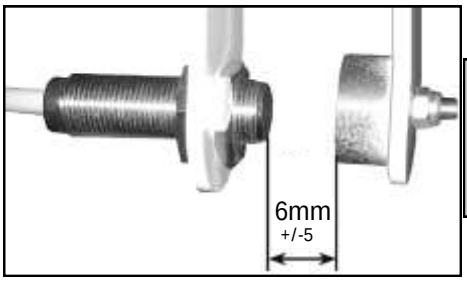
The machine has security devices on the opening of hoods:

An inductive pick-off **(1)** placed on the hood's right door. The electric contact is made when the magnet **(2)** fixed on the left door of the hood is approached.
When you open either one of the doors the security device stops the diesel engine.

There should be no physical contact between the pick-off and its magnet. On the other hand, respect a functional clearance between the two of 5 to 15mm.







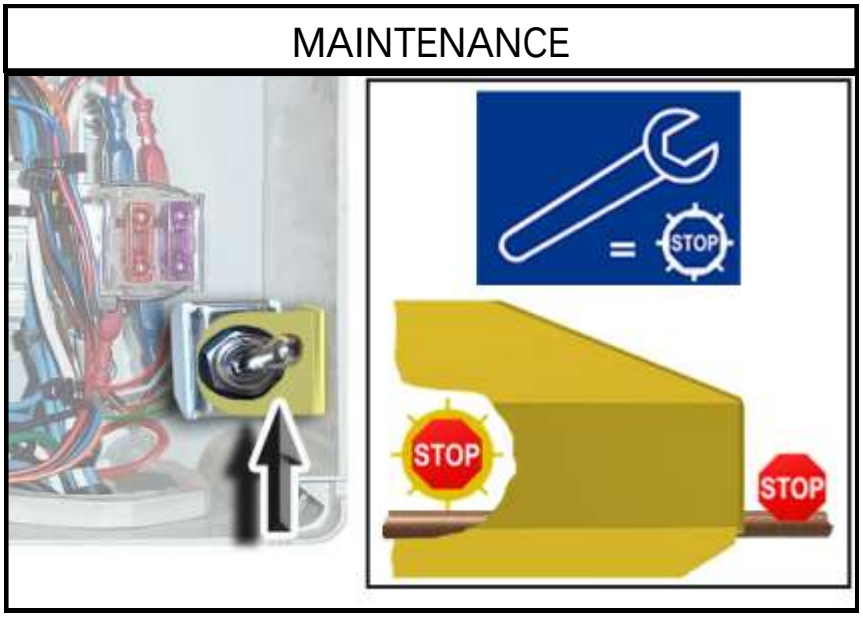
There may be no physical contact between sensor and magnet. There must be 0,24 (+/- 0.20) in (6 mm+/-5) play.

During an intervention on the engine for which it is requireed to run with open cover **(only by a trained technician)** this device can be bypassed through switch **(3)** (please see the next page)

DESCRIPTION AND MANIPULATION

MAINTENANCE / OPERATING CONTACTOR

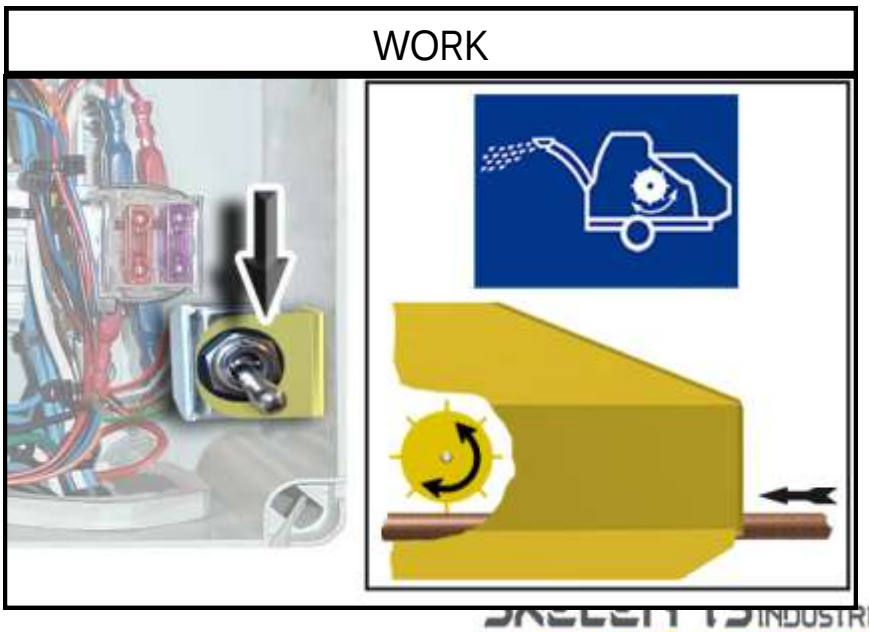
When the engine requires and intervention and it must run with open cover **(only by a trained technician)** it is possible to bypass this device by switching the switch to the top position (**maintenance).**



N.B.: In that position the engine can run but the feed roller will not rotate whatever the engine's speed. If after servicing the technician forgets to re-toggle the switch in lower position, the user will not be able to run the machine. He will be obliged to re-toggle the contactor in operating position and close the hoods to be able to start the engine.

In normal operation, the work/ maintenance switch is in the bottom position (**work)**

When the cover is opened while the engine is running, the sensor on the left door stops the diesel engine.



EMERGENCY STOP BUTTONS

The machine also has two emergency circuit breaker buttons placed at the top of each side of the feed hopper.

When they are activated, these emergency circuit-breakers have two functions:

1) stopping the diesel engine

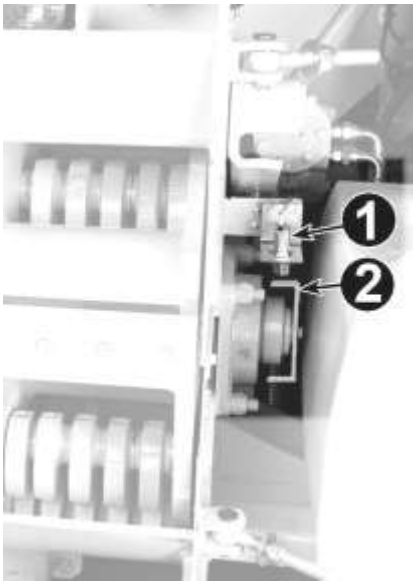
2) instantly stopping the forward run of the feed roller and the belt

DESCRIPTION AND MANIPULATION

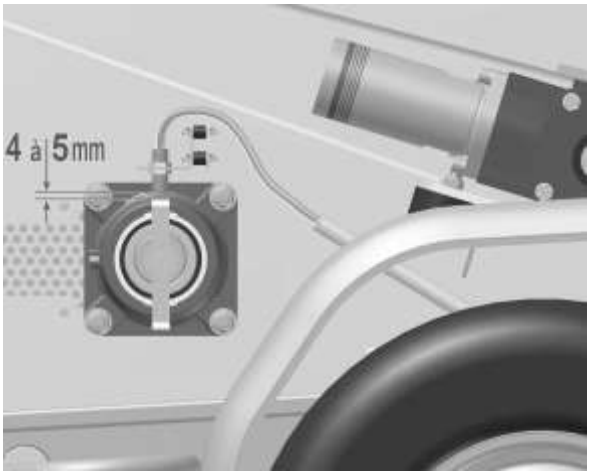
VarioStress ANTI-JAM SYSTEM

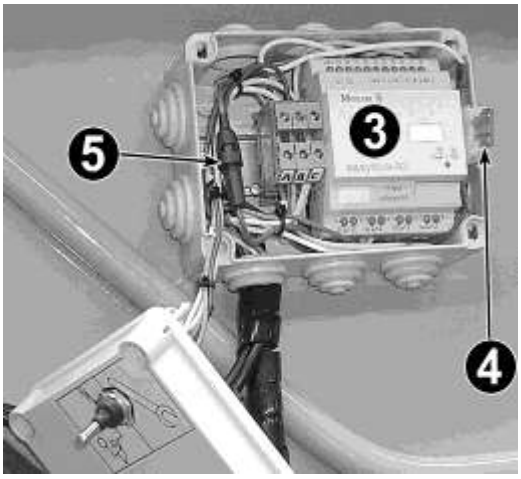
The VIPER is equipped with a controller of the rotation of the rotor that is linked to an automat. Hence, we can prevent the machine from being blocked: permanent information about the rotating speed of the rotor is being sent to the VarioStress. When the rotor speed falls below a factory-set threshold, the hydraulic supply of the feed is interrupted. The feed and belt will stop, the machine will no longer be fed material and the engine can reach its working speed agian (2700T/mn). When the speed exceeds the lower threshold, the feed roll and belt are supplied with oil again and the engine starts running again.

There are three anti-obstruction settings: see the next page



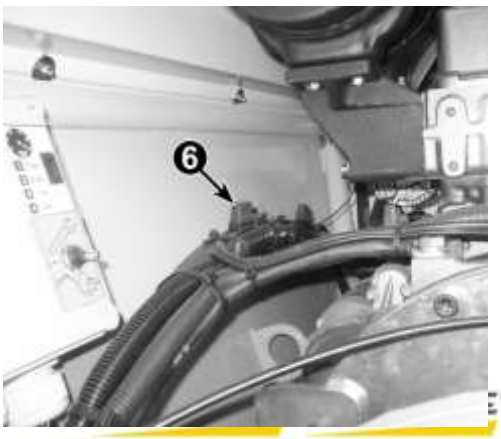
The distance between the speed controller **(1)** and the pulse device **(2)** is **0,16 to 0,20 in (4 à 5 mm)**.





An automat **(3)** controls the No Stress anti-jam system's solenoid valve. It is located with the protection fuses **(5)** (1 amp.) and **(4)** (10 amp.) in the distribution box located on the hopper's right front part.

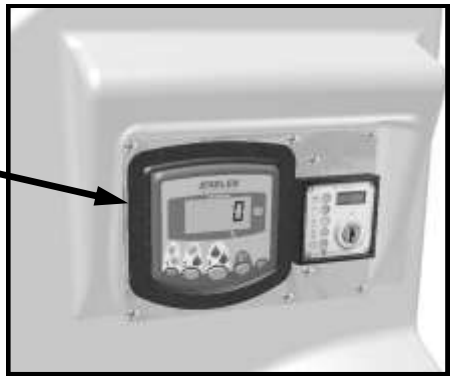
The primary circuit's protection fuse **(6)** (10 amp.) is in the watertight fuse-holder on the starter cable.



DESCRIPTION AND MANIPULATION

ANTI-OBSTRUCTION SYSTEM VarioStress:

Different settings:



The VarioStress anti-obstruction system has three preset configurations. The user can choose the one that is most appropriate for the material at hand.

Configuration **1**: favours functioning at a wide range of motor speeds, mainly suitable for chipping branches and light amterials

Configuration **2**: suitable for manipulating mixed materials consisting of branches, vegetation and conifers.

Configuration **3**: a higher engine speed to improve ventilation for chipping plants and confers or heavy and dense materials during a long period of time

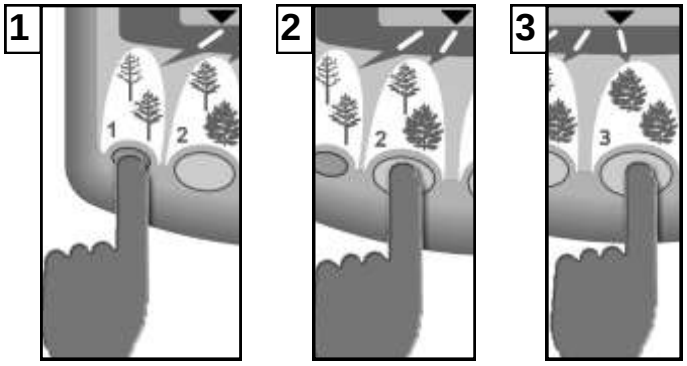
DESCRIPTION AND MANIPULATION

ANTI-OBSTRUCTION SYSTEM VarioStress: cont.

Selecting a setting:

- Engine is on or off, contact is engaged

Use Keys 1,2.3 to display the requested page.



Rem.: push during 1 to 1,5 seconds to change the program.

-Continuous Display of the Engine Rotation/ Operating Speed

-Display of functioning / running hours is done by pressing the ⧗h Key of the Motor (engine off or on)

Functioning/running time count can only be performed if the chipper shredder rotor is in motion

Press the key for about one second

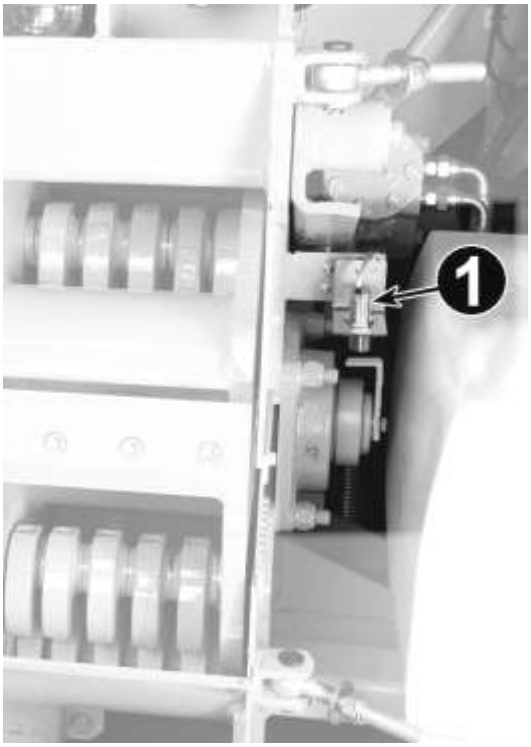
See Use of the machine in manual mode on page 61
+ intervention technician p.52

SENSOR NO ROTOR ROTATION

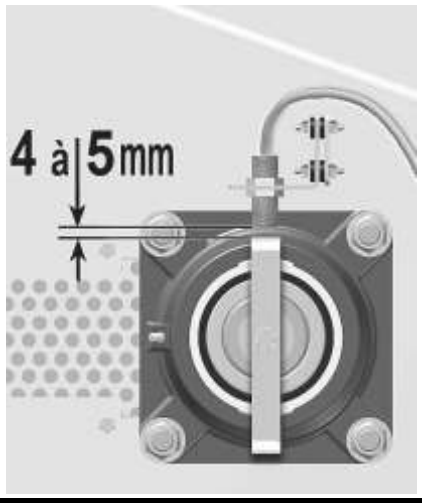
The VarioStress sensor **(1)** is also used to monitor the rotating movement and complements the thermal safety (mark **(2)** on the next page**).** It stops the diesel engine by cutting off the fuel supply if the rotor does not rotate after starting the engine.

10 seconds after supplying tension if the contact remains switched on without an attempt to start the engine. The electrical power supply from the automaton is interrupted automatically and the engine cannot start.

10 seconds after starting the engine this sensor checks the rotatino of the rotor. If the rotor has not exceeded 60 r/mn after this time (minimale intervention threshold) the sensor will shut the diesel engine down and cut off the electricity supply from the automaton. **Check why the rotor has been blocked** (residual material), **set the contact to zero and restart.**



Please note that if the engine stops after 10 seconds, you must always try to find the cause of the problems. Do not try to start the engine multiple times. Since the engine runs during 10 seconds at every attempt, the coupling temperature will continue to rise and activate the safety (2) (next page)

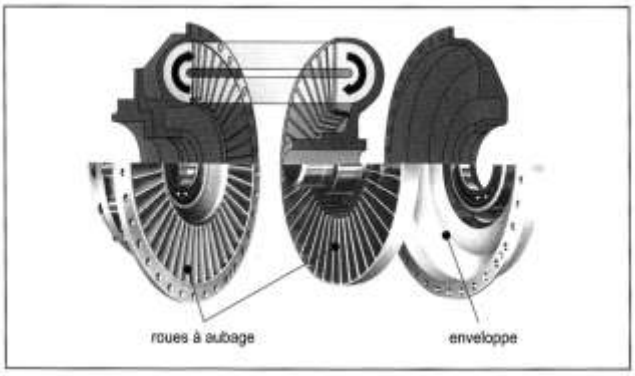


The distance between the sensor **(1)** and the index **(2)** must be **0,16** to **0,20 in (4** to **5 mm)**

See Use of the machine in manual mode on page 61
+ intervention by technician p.52

DESCRIPTION AND MANIPULATION

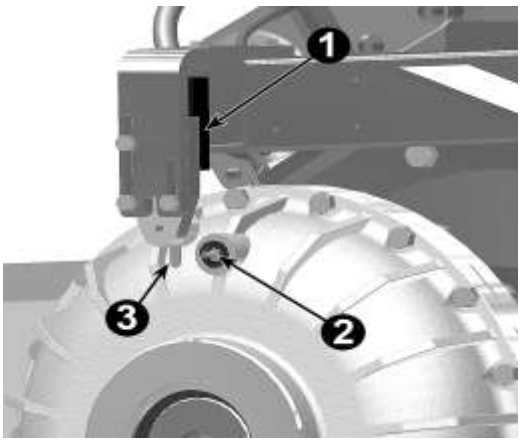
HYDRAULIC COUPLING



FUNCTIONING OF THE HYDRAULIC COUPLING

The Westcar coupling is a hydrodynamic coupling according to Föttinger's principle. It mainly consists of two paddle wheels (pump and turbine) and an external housing. The two paddle wheels are supported by bearings. The power is transmitted without hardly any wear because there is no mechanical contact between the elements. The coupling contains a constant quantity of liquid. The mecanical energy of the drive engine is transformed into kinetic energy in the connected wheel pump. This kinetic energy is again transformed into mechanical energy in the turbine wheel.

THERMAL SAFETY 145° and 180°



In case of abnormal overheating of the internal oil of the coupling (above 140°C), the thermal fuse **(2)** releases an axis that moves the handle **(3)** of the switch of the thermal safety **(1)** . This switch interrupts the fuel supply which stops the engine. To restart, the thermal fuse **(2)** must be replaced and the handle **(3)** must return to its original position.

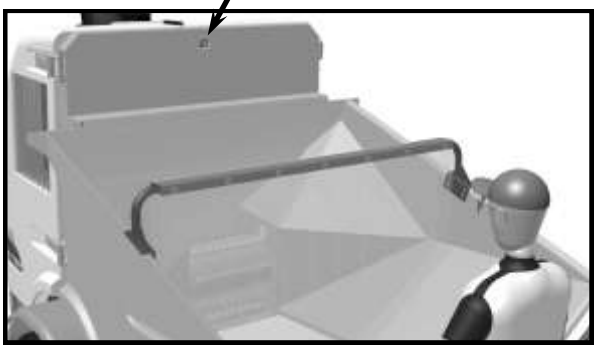
If the engine is blocked when the machine is started (e.g. by a branch if the machine was not correctly emptied at the last stop), the switch does not work. The coupling is not rotating, the oil temperatur in the coupling quickly rises and is ejected through the green cap that melts at temperatures over 180°C.

In order to prevent this inconvenience, an additional safety has been provided *(see previous page).*

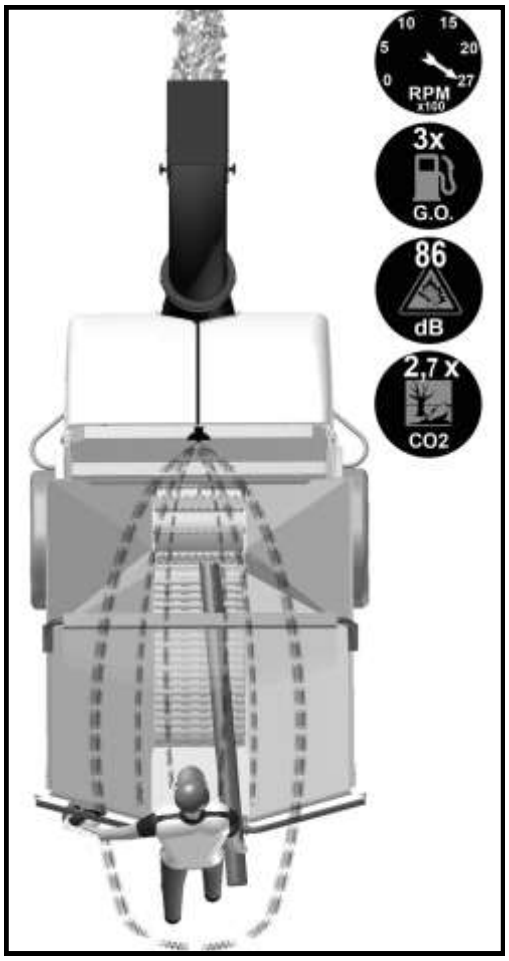
If the safety (2) is activated, always investigate the cause of the problem. Never attempt the start the engine several times. The temperature inside the coupling will continue to rise and eventually the green cap will melt (180°). The oil is then ejected. *(This fuse cannot be reset and must be replaced).*

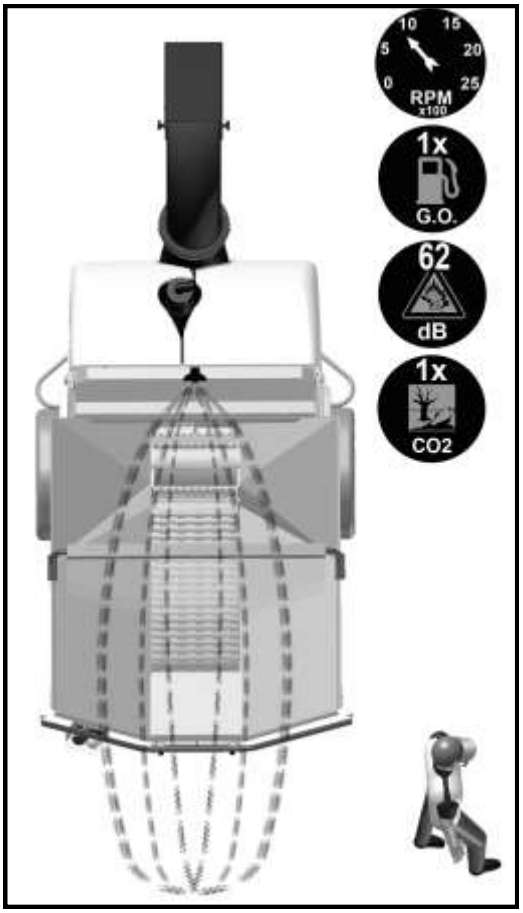
DESCRIPTION AND MANIPULATION

Functioning of the **CO2 REDUCTION system** (option)



The chipper is a machine that is permanently working at full engine speed. The periods of chipping are alternated with passive idle moments, the duration of which depends on the configuration of the works. Hence, the noise, the fuel consumption and the emission of CO2 are at maximum levels.





In order to avoid these inconveniences and in view of the environemnt, every time the operator leaves the chipper the CO2 REDUCTION system will automatically switch the engine to idle after a certain amount of time. That will reduce the nuisance considerably. As soon as the CO2 REDUCTION radar detects that the operator approaches the hopper to put branches in it, the engine returns to its maximum speed. At the same time, the feed belt/roll starts to rotate again after two seconds in order to resume chipping.

In addition to the mentioned environmental advantages, the CO2 REDUCTION SYSTEM also makes it possible to increase the life span of all moving parts of the machine: diesel engine, transmission, feed belt, feed roll, engines and hydraulic circuits.

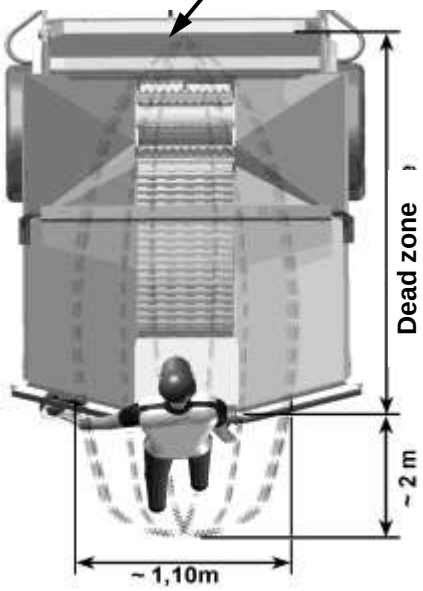
See use on the following pages

DESCRIPTION AND MANIPULATION

Presence detector

The presence detector at the back of the housing detects the operator up to 2 m behind the hopper with a width of approximately 1,10 m. The hopper area is a dead zone that is not taken into consideration by the detector. Objects in this area will not accelerate the diesel engine or the rotation of the feed belt/roll.

All objects, even inert ones, e.g. a wall or a vehicle at less than 2 m behind the chipper will generate the automatic acceleration of the engine.

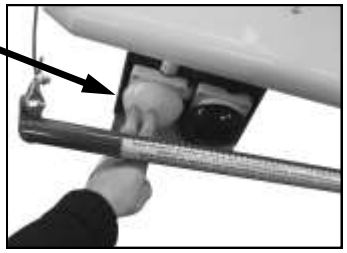


Using the machine with the CO ² reduction:

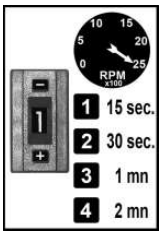
-Start the engine and heat

Gear handle high, idle

-**Remain push 1 second on the yellow button** (forward feed roller), engine accelerate, **CO² reduction system and feed roller advance are now activate**, you could release the button & start to work.



- The engine will remain accelerate until the worker being at the back the feeding hopper.
- If it's move away from the machine, the engine will return to the idle after a laps time defined by the coil coder button position.



- The engine will accelerate automatically when the worker will be detectected again at the back the feeding hopper.

To switch off the CO² Reduction system, push 1 second on the black button (backward feed roller).

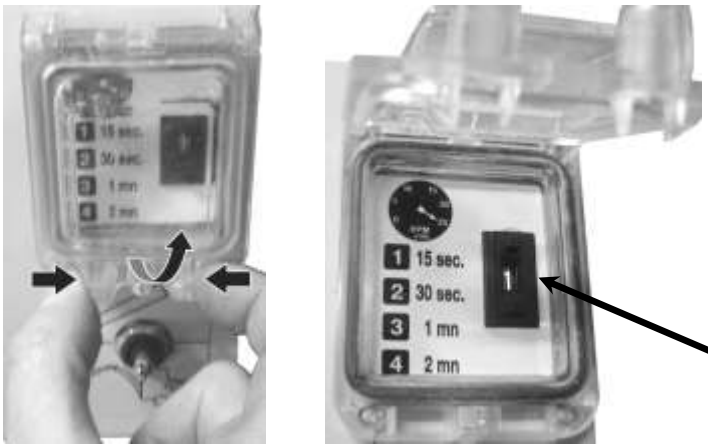
The engine will return to the idle.

Using the machine without the CO ² reduction:

-Start the engine and heat few minutes.
- Accelerate the engine to maximum speed with the gear handle.
- Order the forward & backward operations (feed roller & belt) to push normaly & briefy on the yellow & black button.

DESCRIPTION AND MANIPULATION

Access to the setting wheel:



The wheel numeric is protected from the weather by a waterproof cover

Setting wheel

The duration of the maximum speed must be determined by the operator. **(The modification is valid as of the next start)**

Four different configurations are possible, set by means of the numbers on the setting wheel.

-Shut down contact and choose the working time with the + and—keys of the setting wheel:

- **1** = 15 seconds at maximum speed
- **2** = 30 seconds at maximum speed
- **3** = 1 minute at maximum speed
- **4** = 2 minutes at maximum speed

(Do not use n° 0 and 5 to 9)

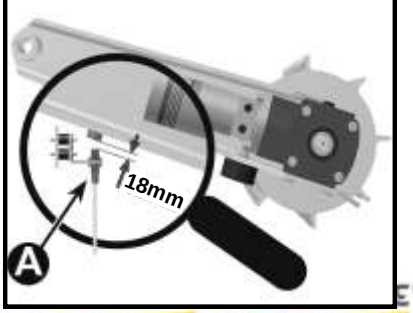
Example*: The figure shows program* ***1,*** *the diesel engine will idle until 15 seconds after the user has left.*

Sensor opening feed for end of chipping

If the user has left the chipper and the time delay ends whilere there is still material being fed by the belt/roll, a sensorsensor **(A)** is activated for the opening of the feed equipment. It prolongs the time delay with the same amount of time as the setting wheel.

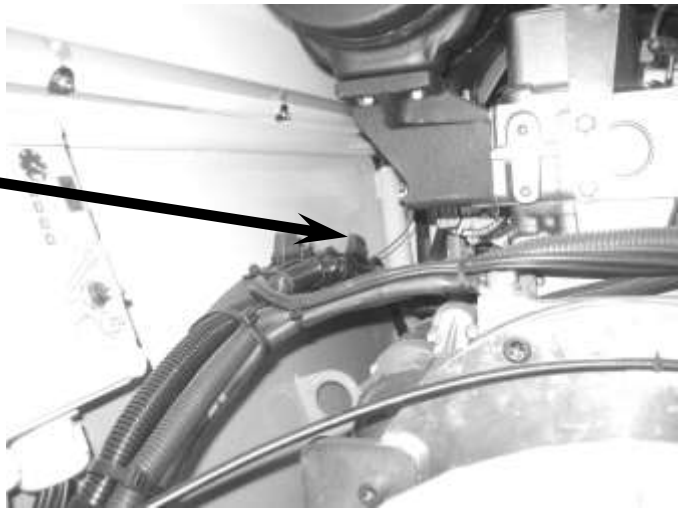
Example*: Delay at* **1***= 15sec.: the user leaves after 14 seconds while there is still chipping material on the feed belt. After 15 sec, the sensor will prolong the maximum speed during another 15 seconds.*

Setting sensor **(A), inlet at the bottom**: **0,70 inch**



DESCRIPTION AND MANIPULATION

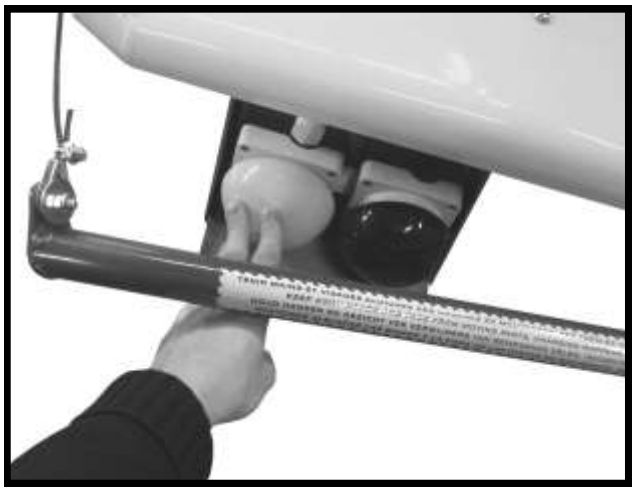
The 15 Amp fuse of the gear equipment is in the enclosed fuse holder next to the alternotor.

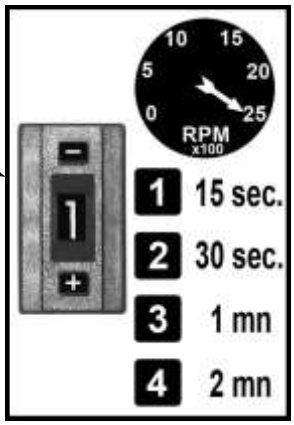


Specific information on the functioning of CO2 Reduction:

Temporary interruption of the presence detector:

The atmosphere contains an impressive number of waves and magnetic fields that sometimes interfere with the presence detector and thus prevent the automatic restart of the engine. To prevent that, the operator can force the activation of the acceleration for a duration that is determined by the **setting wheel**. The operator must support 1 second on the **yellow button** to start the acceleration



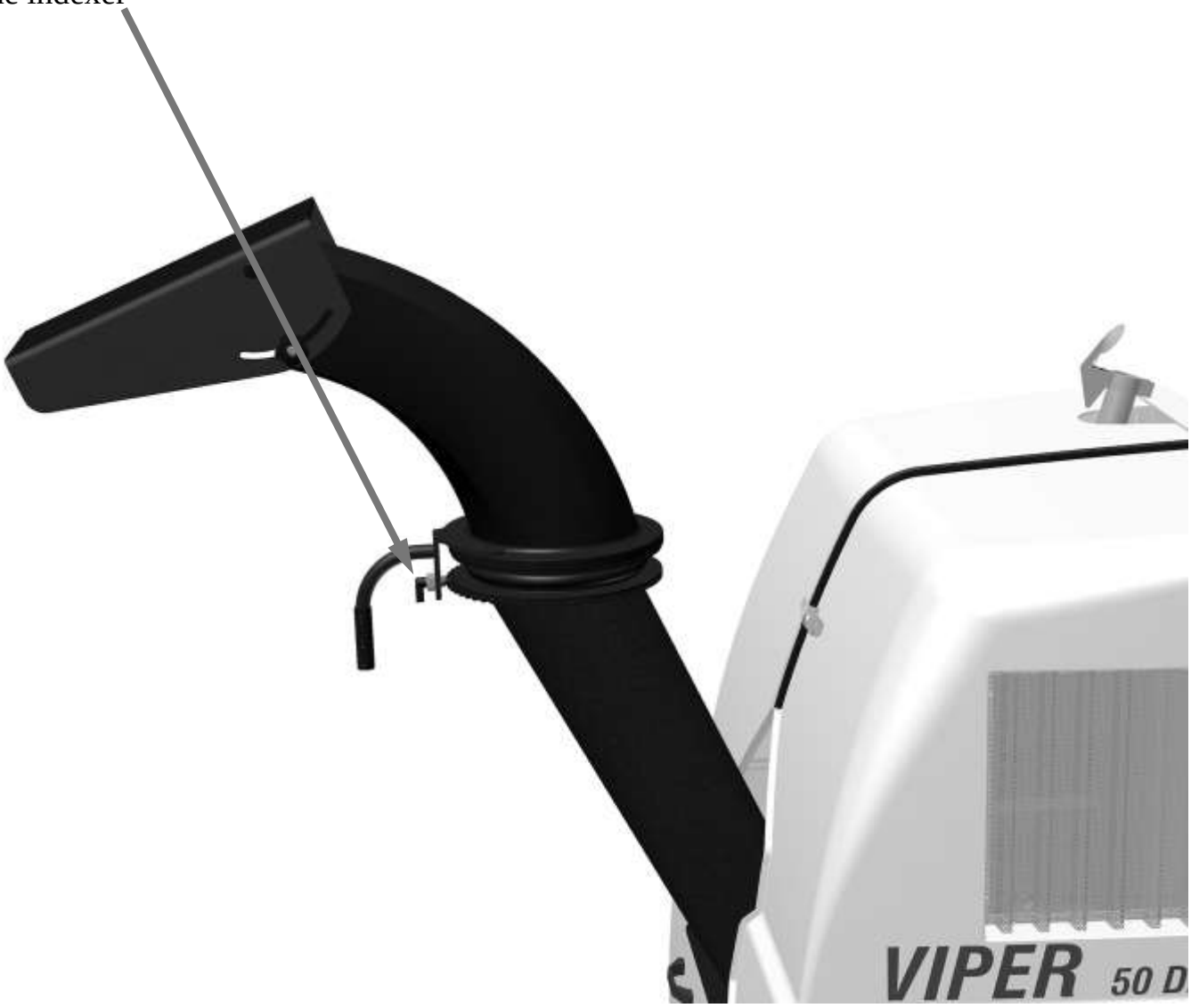


Interference with the presence detector:

-Never modify the height of the containing lips
-Never modify the inclination of the radar holder
-Never put branches on the holder of the lips
-Automatic acceleration of the engine in case of **very heavy rainfall**

EVACUATION SHAFT

The top part of the discharge chute can be oriented 90° to the left and 90° to the right via the indexer



PROBLEM-SOLVING

In this section, we provide a list of problems, their causes as well as possible Solutions. If you experience a problem that is not mentioned here, please contact your reseller. Keep your user manual and the serial number of your chipper at hand.

INTERVENTION BY A TECHNICIAN ON THE ELECTRICAL CIRCUIT:
Since 2008 all TS Industrie chippers offer the possibility to shunt rotation controller M18 of the rotor. The technician can then investigate an electrical fault on the machine without starting the engine (see p. 45). The shunt will stop automatically when the contact is broken.
Check the TS Industrietechnical customer service in your area or the TS Industrie after sales department. They will explain how to shunt controller M18.

PROBLEM	CAUSE	SOLUTION
The engine will not start.	-Safety of the coupling activated.	-See page 45 and 46
	-Safety of the emergency button activated.	-Turn off the safety.
	-The cover is open.	-Check if the covers are closed
	-The safety sensor of the cover is defect.	-Check them (see p.39)
	-Fuse melted in the branch box.	-Replace the fuse.
	-The battery is low.	-Load or replace the battery
	-The power cables have been damaged.	-Check the electrical circuits.
	-The electrical valve that stops the engine is broken.	-Check the valve.
Reduced engine power	-Filter blocked	-Replace the filter
	-Blades and hammers blunt	-Grind or replace the blades. Replace the hammer inserts.

PROBLEM-SOLVING

PROBLEM	CAUSE	SOLUTION
The engine stops early and will not start again	-The cover is not properly closed. -The safety of the coupling is activated. -The red light of the water temperature is on. -The safety sensor of the cover is defect. -There is no fuel left.	-Check if the covers are closed properly. -See page 45 and 46 -The radiator is dirty: clean -Check it (see p.39) -Add fuel
The belt/roll will not rotate forward or backward	**-The switch *work/ maintenance* is in the maintenance position** -Fuse melted in the branch box or the fuse holder on the large starter cable (see p.42) -Speed wheel feeding equipment completely tightened -Hydraulic engine or pump defect -Not enough oil in the tank	**-Set the switch to the work position (see p.40)** -Replace the fuse -Loosen the setting wheel on the distributor -Check or replace the defect part -Check the oil level
The rotor will not rotate while the engine is working	-No oil left in the coupling -Belts defect or insufficiently tightened -Rotor blocked	-Check the oil level -Replace and/or tighten the belts -See page 22
The machine has problems chipping	-Blades and hammers blunt -Coupling oil level too low -Belts defect or unsufficiently tightened -Anti-obstruction system out of service	-Grind the blades or replace them. Replace the hammer inserts. -Supplement the oil level. -Replace and/or tighten the belts. -Check the fuses p.42
Feeding in forward operation is not regulated, not even below the VarioStress intervention threshold	-electrical or hydraulic problem	-Please contact the seller

PROBLEM-SOLVING

CO2 REDUCTION (option)

Operating switch CO2 RÉDUCTION activated

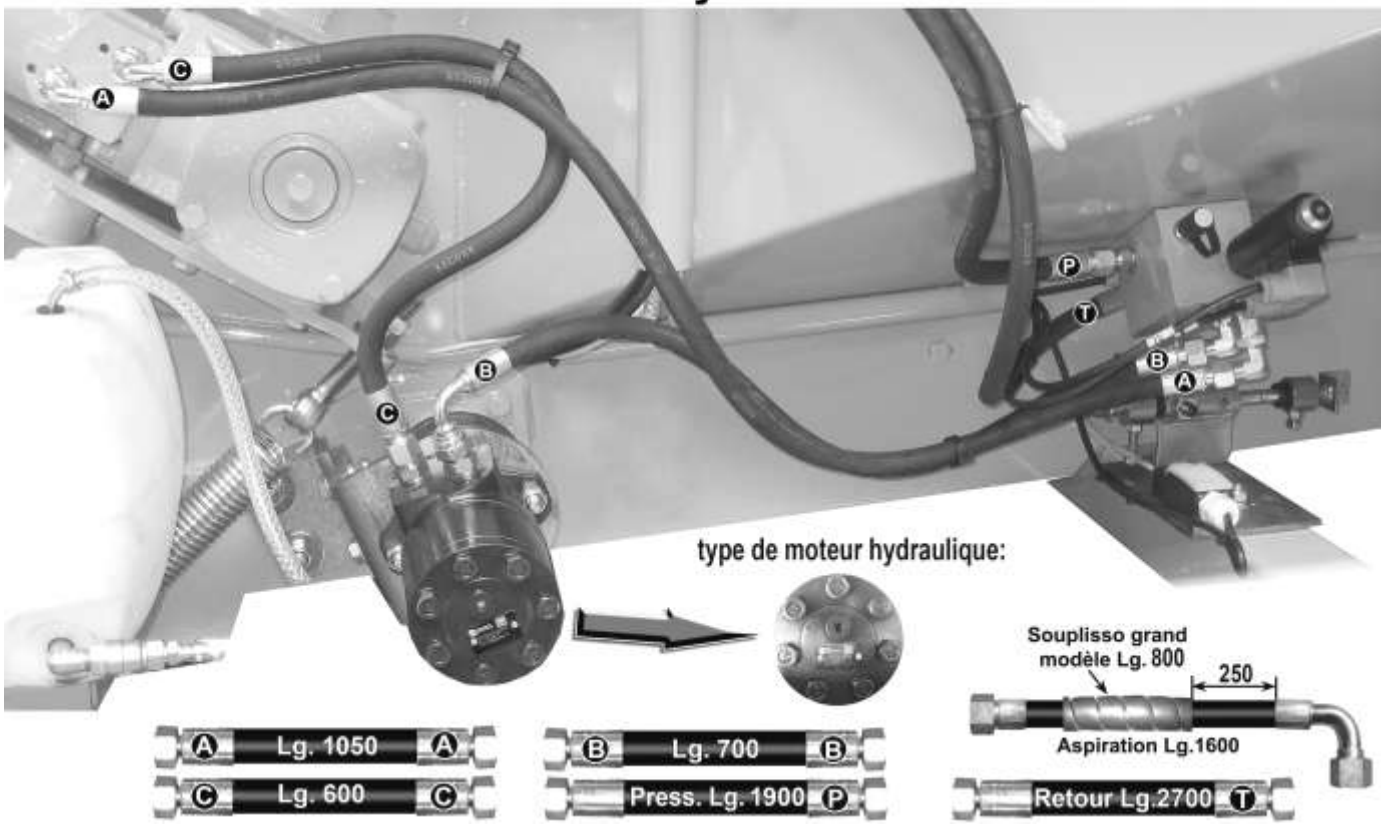
PROBLEM	CAUSE	SOLUTION
The engine does not automatically accelerate	-The diesel engine is not warm enought, the green light is not on. -Poor alignment of the vision area of the radar -30 amp fuse melted -Radar interference -Radar problem	-Waint until the temperature is higher and the green light is on (see page 48) -Check if the radar is horizontal. -Check the fuse, see p.49 -Check if there is no branche above the arch and/or if the lips are not put upwards above the holder -Switch off the engine and check at the back of the radar if the engine is warm and if, 10 seconds after making contact: * the 1st green light is on * the 2nd yellow light is on when a person is detected behind the hopper of the chipper * if the 2nd light is blinking red: contact the seller
The engine remains at maximum speed	-The feeding unit is not lowered completely -The sensor for the end of the chipping activity is disturbed	-Check of the feeding arms are resting on their silentblocs -Check the setting of the sensor (see sensor **(A)** p.49)

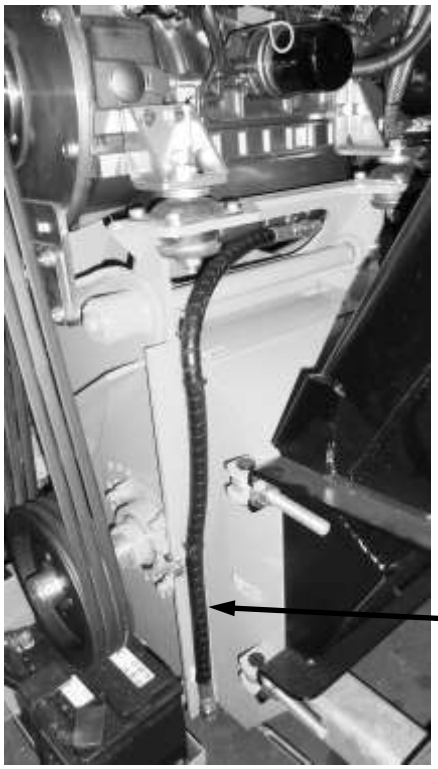
SPECIFICATIONS

	VIPER 50 DRI
Capacity:	170 mm
Hourly output:	30m3
Length:	4,00 m
Largeur:	1,88 m
Height:	2,46 m
Weight without belt:	1610 Kg
Number of hammers:	14
Number of knives:	4
Rotor's diameter:	560 mm
Rotor's weight:	160 Kg
Rotor's width:	400 mm
Engine's power:	50Cv Kubota V2203
Gas-oil capacity:	45L
Engine speed:	2900 rpm
Rotor's speed:	2140 rpm
Anti-jamming:	YES
Hydraulic supply:	YES
Hydraulic capacity:	24 L
Hydraulic pressure:	120 bar
Road axle:	YES
Soundproofing:	YES
Number of wheels:	2
Tyre dimensions:	195R14
Tyre air pressure:	4,5 bar

HYDRAULIC COUPLING

VIPER
avec moteurs hydaul. WHITE

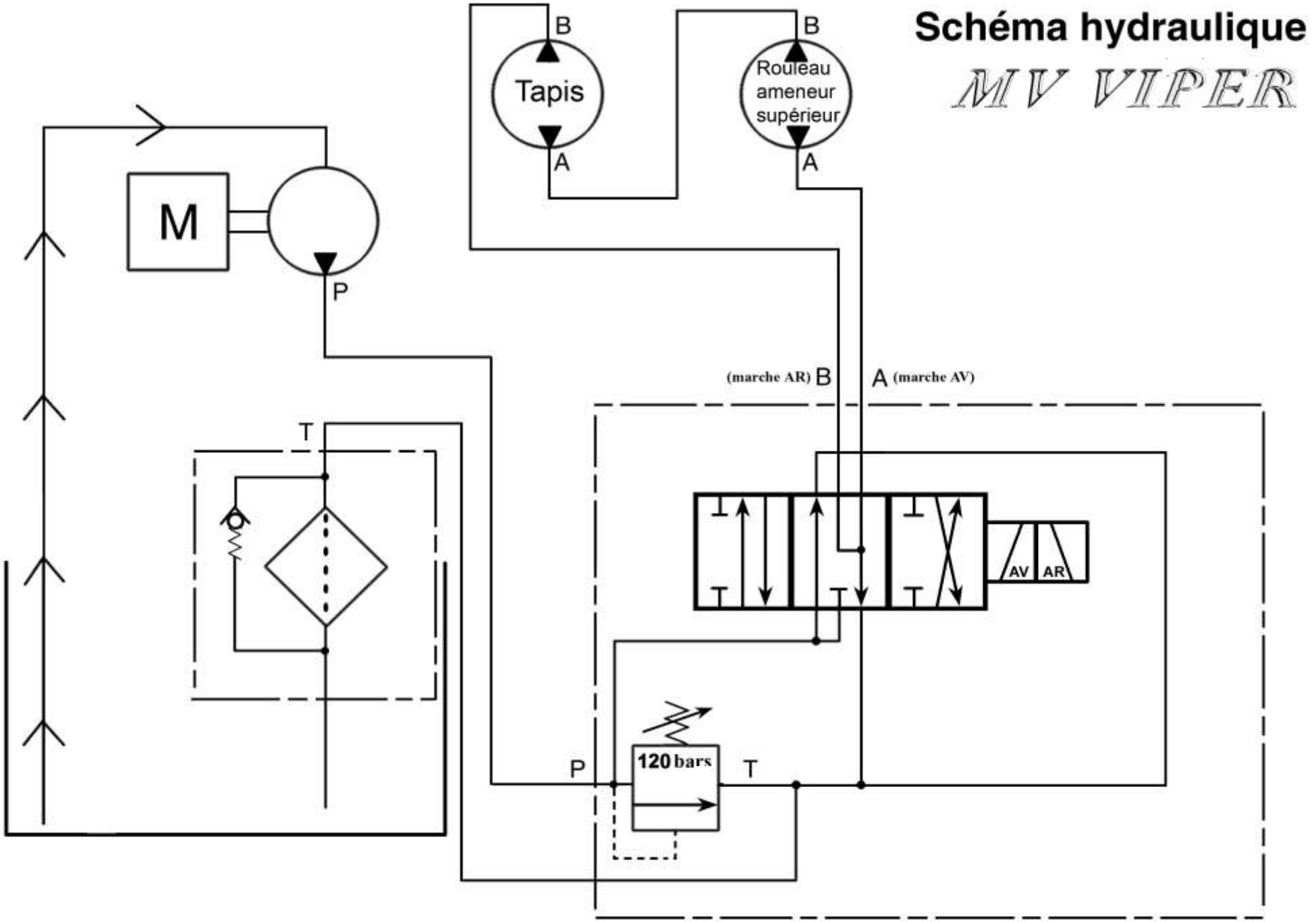




ENGINE OIL CHANGE HOSE
(do the oil change hot)

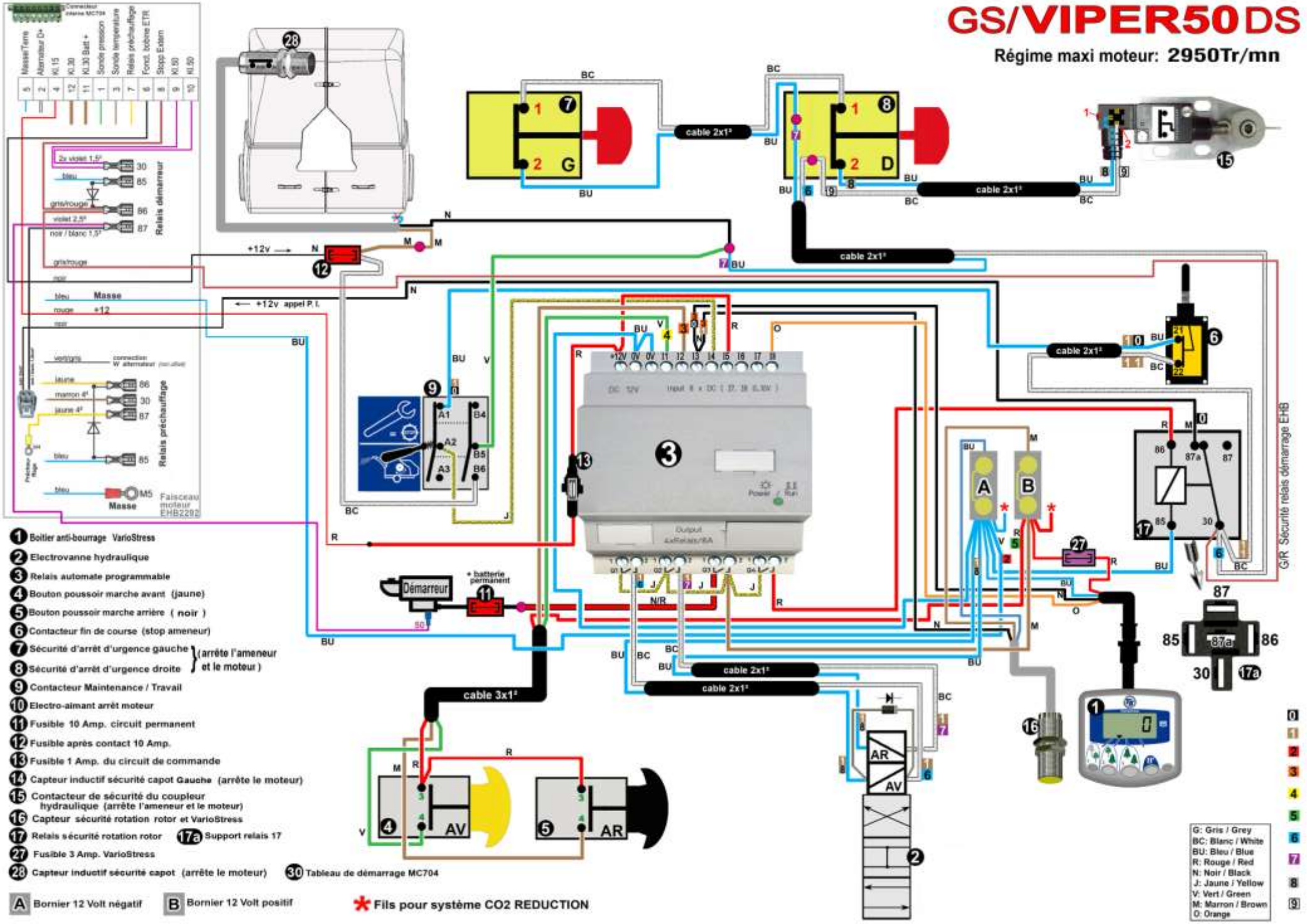
Schéma hydraulique

MV VIPER



GS/VIPER50DS

Régime maxi moteur: 2950Tr/mn



1. Boitier anti-bourrage VarioStress
2. Electrovanne hydraulique
3. Relais automate programmable
4. Bouton poussoir marche avant (jaune)
5. Bouton poussoir marche arrière (noir)
6. Contacteur fin de course (stop ameneur)
7. Sécurité d'arrêt d'urgence gauche } (arrête l'ameneur et le moteur)
8. Sécurité d'arrêt d'urgence droite
9. Contacteur Maintenance / Travail
10. Electro-aimant arrêt moteur
11. Fusible 10 Amp. circuit permanent
12. Fusible après contact 10 Amp.
13. Fusible 1 Amp. du circuit de commande
14. Capteur inductif sécurité capot Gauche (arrête le moteur)
15. Contacteur de sécurité du coupleur hydraulique (arrête l'ameneur et le moteur)
16. Capteur sécurité rotation rotor et VarioStress
17. Relais sécurité rotation rotor
17a. Support relais 17
27. Fusible 3 Amp. VarioStress
28. Capteur inductif sécurité capot (arrête le moteur)
30. Tableau de démarrage MC704

A Bornier 12 Volt négatif

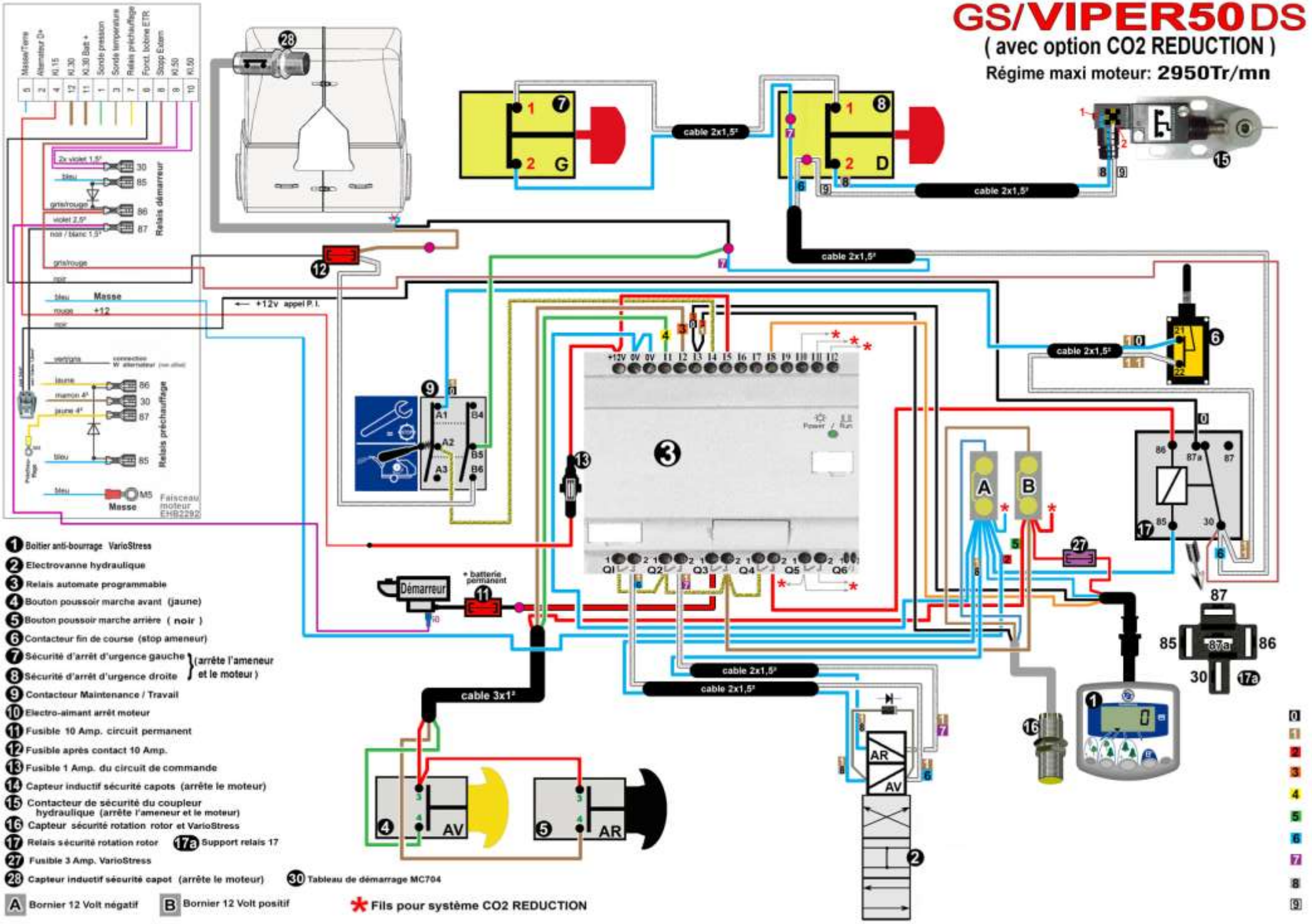
B Bornier 12 Volt positif

* Fils pour système CO2 REDUCTION

GS/VIPER50DS

(avec option CO2 REDUCTION)

Régime maxi moteur: 2950Tr/mn



1. Boitier anti-bourrage VarioStress
2. Electrovanne hydraulique
3. Relais automate programmable
4. Bouton poussoir marche avant (jaune)
5. Bouton poussoir marche arrière (noir)
6. Contacteur fin de course (stop ameneur)
7. Sécurité d'arrêt d'urgence gauche } (arrête l'ameneur
8. Sécurité d'arrêt d'urgence droite } et le moteur)
9. Contacteur Maintenance / Travail
10. Electro-aimant arrêt moteur
11. Fusible 10 Amp. circuit permanent
12. Fusible après contact 10 Amp.
13. Fusible 1 Amp. du circuit de commande
14. Capteur inductif sécurité capots (arrête le moteur)
15. Contacteur de sécurité du coupleur hydraulique (arrête l'ameneur et le moteur)
16. Capteur sécurité rotation rotor et VarioStress
17. Relais sécurité rotation rotor — 17a Support relais 17
27. Fusible 3 Amp. VarioStress
28. Capteur inductif sécurité capot (arrête le moteur)
30. Tableau de démarrage MC704

A Bornier 12 Volt négatif

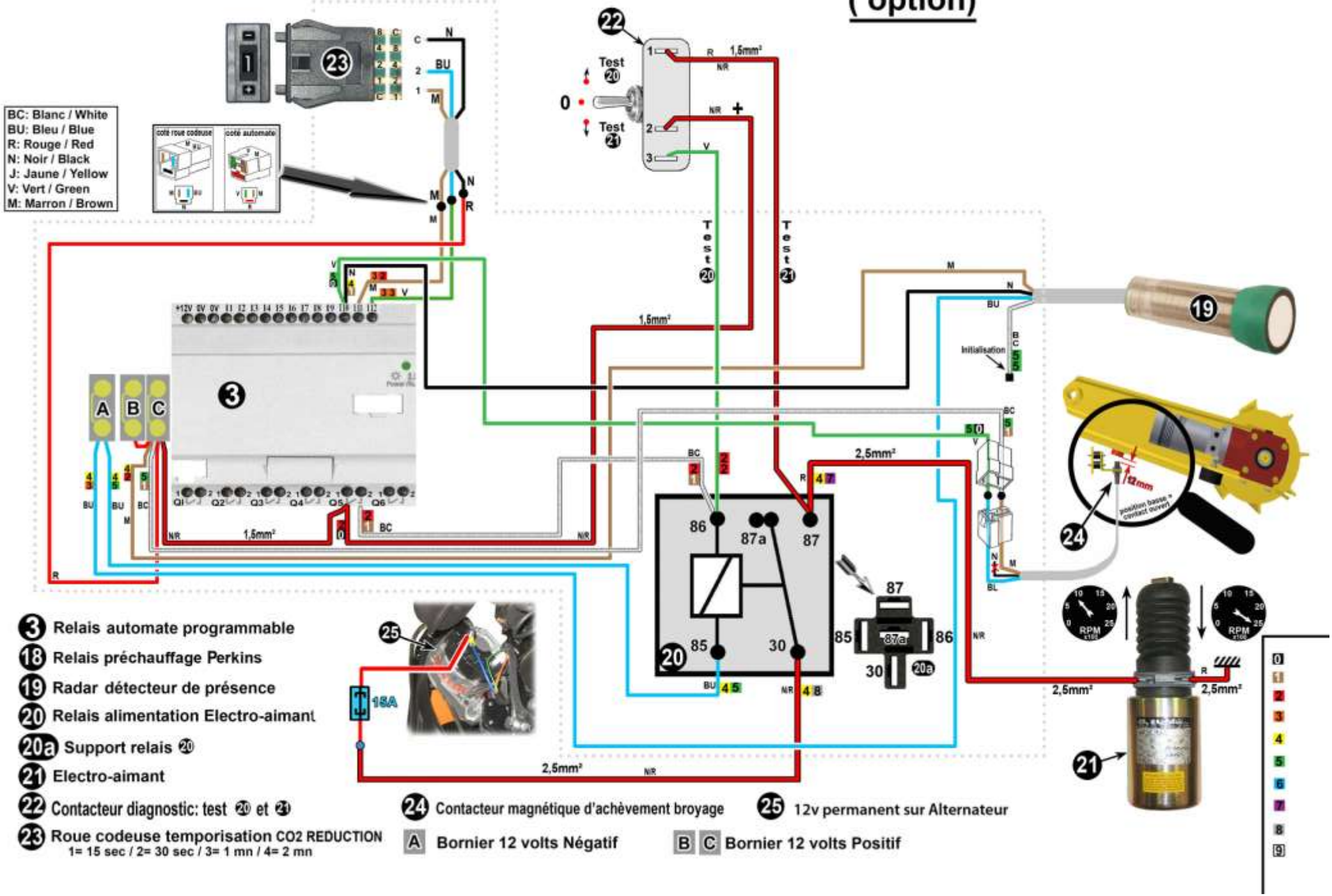
B Bornier 12 Volt positif

* Fils pour système CO2 REDUCTION

SCHEMA ELECTRIQUE SYSTEME CO2 REDUCTION

GS/VIPER50DS

(option)



3 Relais automate programmable

18 Relais préchauffage Perkins

19 Radar détecteur de présence

20 Relais alimentation Electro-aimant

20a Support relais 20

21 Electro-aimant

22 Contacteur diagnostic: test 20 et 21

23 Roue codeuse temporisation CO2 REDUCTION
1= 15 sec / 2= 30 sec / 3= 1 mn / 4= 2 mn

24 Contacteur magnétique d'achèvement broyage

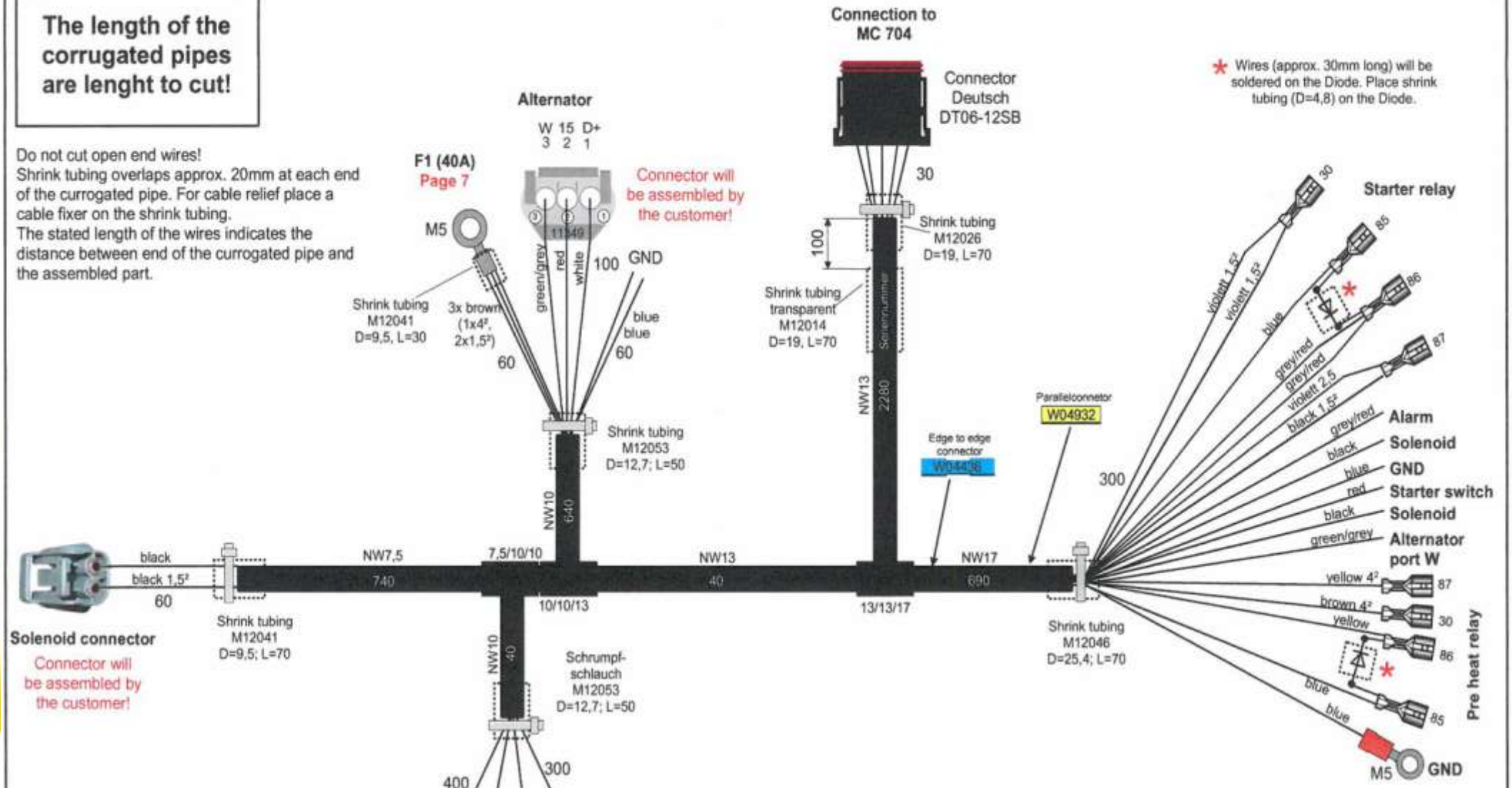
25 12v permanent sur Alternateur

A Bornier 12 volts Négatif

B C Bornier 12 volts Positif

The length of the corrugated pipes are lenght to cut!

Do not cut open end wires!
Shrink tubing overlaps approx. 20mm at each end of the currogated pipe. For cable relief place a cable fixer on the shrink tubing.
The stated length of the wires indicates the distance between end of the currogated pipe and the assembled part.



Wire cross sections that are not noticed are all 1mm².
Caution: Inductivity (as solenoid) need to be assembled with an interference suppression diode (as 1N4007)!
Before working on the installation/machine disconnect the Battery!
Al wires outside the controller acording to the motormanufacturer.

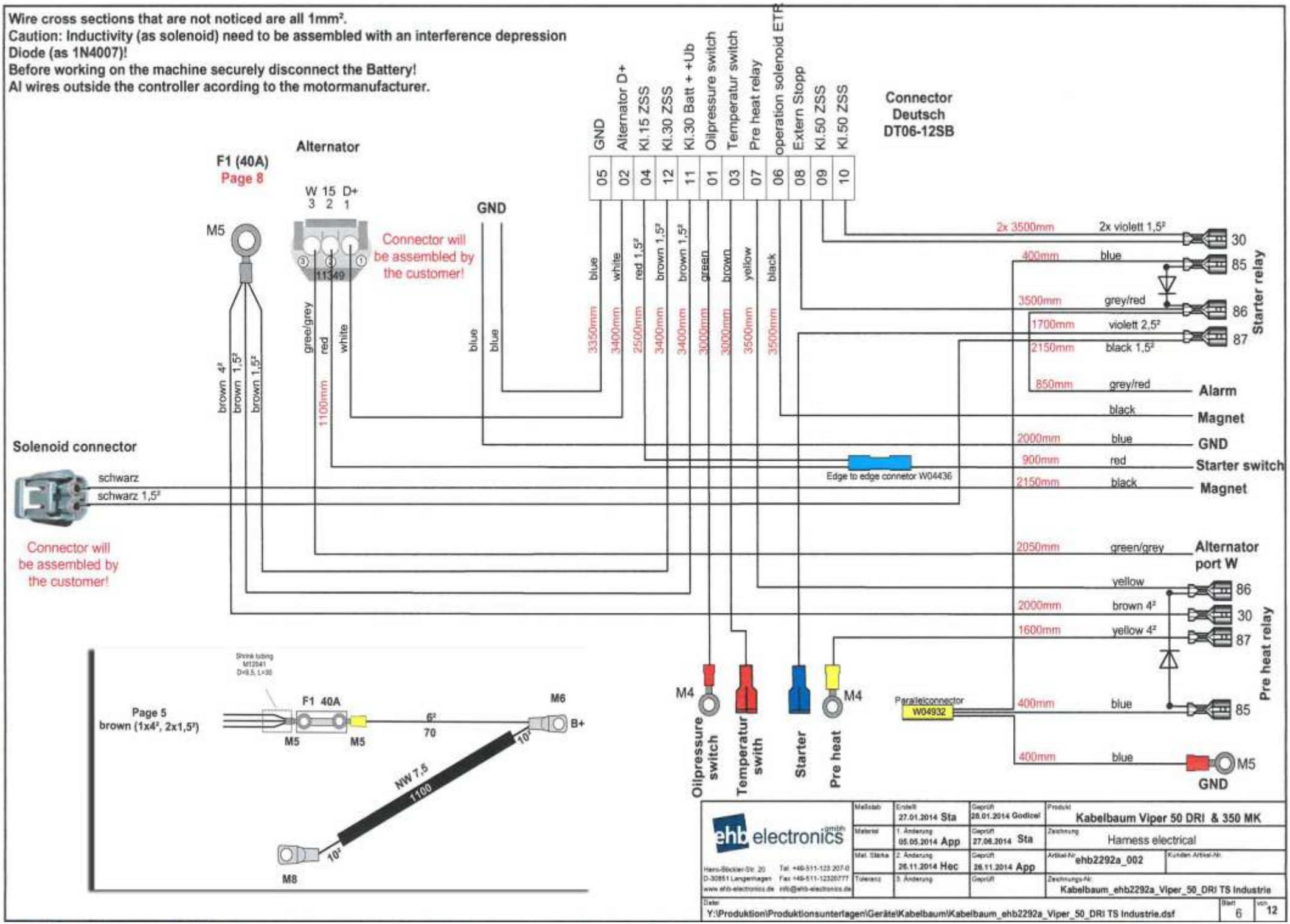
1. Änderung: Diverse Korrekturen
2. Änderung: Leitungslängen Anlasser und Temp.schalter nach Kundenwunsch geändert. Wellrohrlängen auf Schnittlängen geändert. Darstellung überarbeitet. Einbau Parallelverbinder. Ringkabelschuh M5 für Leitungsquerschnitt angepasst.
3. Änderung:

ehb electronics gmbh	Maßstab	Erstellt 27.01.2014 Sta	Geprüft 28.01.2014 Godicel
	Material	1. Änderung 05.05.2014 App	Geprüft 27.06.2014 Sta
	Mat. Stärke	2. Änderung 26.11.2014 Hec	Geprüft 26.11.2014 App
	Toleranz	3. Änderung	Geprüft

Produkt: Kabelbaum Viper 50 DRI & 350 MK
Zeichnung: Harness mechanical
Artikel-Nr.: ehb2292a_002
Kunden Artikel-Nr.
Zeichnungs-Nr.: Kabelbaum_ehb2292a_Viper_50_DRI TS Industrie
Datei: Y:\Produktion\Produktionsunterlagen\Geräte\Kabelbaum\Kabelbaum_ehb2292a_Viper_50_DRI TS Industrie.dsf
Blatt 5 von 12

Hans-Böckler-Str. 20 D-30851 Langenhagen www.ehb-electronics.de
Tel. +49-511-123 207-0 Fax +49-511-12320777 info@ehb-electronics.de

Wire cross sections that are not noticed are all 1mm².
Caution: Inductivity (as solenoid) need to be assembled with an interference depression Diode (as 1N4007)!
Before working on the machine securely disconnect the Battery!
Al wires outside the controller acording to the motormanufacturer.



ehb electronics gmbh	Maßstab	Erstellt 27.01.2014 Sta	Geprüft 28.01.2014 Godizel	Produkt Kabelbaum Viper 50 DRI & 350 MK
Hans-Böckler-Str. 20 D-30851 Langenhagen www.ehb-electronics.de Tel. +49-511-123 207-0 Fax +49-511-12320777 info@ehb-electronics.de	Material	1. Änderung 05.05.2014 App	Geprüft 27.06.2014 Sta	Zeichnung Harness electrical
	Mat. Stärke	2. Änderung 26.11.2014 Hec	Geprüft 26.11.2014 App	Artikel-Nr. ehb2292a_002 / Kunden Artikel-Nr.
	Toleranz	3. Änderung	Geprüft	Zeichnungs-Nr. Kabelbaum_ehb2292a_Viper_50_DRI TS Industrie
Datei: Y:\Produktion\Produktionsunterlagen\Geräte\Kabelbaum\Kabelbaum_ehb2292a_Viper_50_DRI TS Industrie.dsf				Blatt 6 von 12

SPECIFIC FUNCTIONING

USE OF THE MACHINE IN MANUAL MODE

The sensor of the rotation of the rotor and shunting the VarioStress

On the VIPER 50 DRI as well as on the models PREMIUM and COBRA DRI it is possible (since 2008) to shunt the electronics in the machine by switching to **manual mode** in case of problems on sensor M18 that monitors the rotation of the rotor or on the VarioStress anti-obstruction equipment. Using a simple procedure **(not described in this manual)** the operator can continue to use the machine while he waits for a technician to come and solve the problem.

Contact your reseller for this procedure.

In case of problems on the M18 or VarioStress :

Dhe M18 sensor has a double function:

-give the VarioStress that manages the anti-obstruction system of the rotor rotary speed

-give the atuomaton that stops the engine in case the rotor is blocked at the start rotary speed (see p.45).

- In case the sensor is defect, the engine will stop

- In case the VarioStress is defect, the feed roll will provide forward rotation, in spite of the engine speed.

Solution:

The user can shunt this sensor and the VarioStress by working in **manual mode** but he ***must remain vigilant*** and check if the ***rotor is free*** and starts to rotate ***as soon as the engine is started*** (see p.46).

If the anti-obstruction system is not working, the **manual mode** also allows the operator to make the belt/roll work by using the yellow and black buttons. Even at low speeds the feeding equipment can continue to work, ***so the user must remain vigilant if he handles the feeding of the branches in the rotor himself in function of the engine speed***.

Take care not to let the engine speed drop too low while chipping in order not to overload the hydraulic coupling (see p. 46) or to block the rotor at the discharge.

Breaking the contect when the machine is stopped, resets the manual mode.

If the technician has not replaced the faulty part by the next start, the user must repeat the shunting procedure.

DECLARATION OF CONFORMITY

The **TS industrie** Company

Weserstrasse 2
47506 NEUKIRCHEN-VLUYN

Tél : +49(0)2845 9292-0 - Fax : +49(0)2845 9292-28

HEREBY DECLARES THAT THE MACHINE :

Trademark: *TS industrie™*
Type : ***VIPER 50 DRI***
Engine power: **37 kW**
Technical documentation detained by Mathieu Willerval

that the product is in conformity with the following European directives:

- **2006/42/CE** " EG-Maschinenrichtlinie" Norm
- **2004/108/CEE** "Elektromagnet" Norm
- **97/68/CE** "Vergiftung" Norm
- **2000/14/CE** "Schall" Norm

Conformity appraisal process concerning directive 2000/14/CE Appendix V.

Installed power at 2800 rpm	*Measured Noise Power Level*	*Guaranteed Noise Power Level (Lwa)*
37 Kw	**123 dBA**	**125 dBA**

References of harmonized standards used:

- **EN 13525/A2**

Made in RONCHIN, on September 10th 2012

Mathieu Willerval (Production manager TS-industrie)

Saelen
3 rue Jules Verne
L'Orée du Golf - BP 17
59790 Ronchin
Tél : + 33 (0)3 20 43 87 87
Fax : +33 (0)3 20 34 12 73
contact@saelen.fr www.salen.Fr

Pièces détachées
Tél : + 33 (0)3 20 43 24 89
Fax : +33 (0)3 20 34 12 73

TS Industrie
TS Industrie GmbH
Weserstr. 2
D - 47506 Neukirchen - Vluyn (Germany)
Tel.: +49 2845 / 9292-0
Fax: +49 2845 / 9292-28
kontakt@ts-industrie.de